Science, Technology And The Future of Humanity

Paulos Mar Gregorios

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Contents

Foreword - Fr. Dr. K.M. George *vii*
Introduction - Joseph P. Varghese *ix*

1. Does Humanity Have a Future? 1
2. Humanity, Nature and God 7
3. Humanization as a World Problem 11
4. Science, Technology and the Future of Humanity 34
5. Emerging Consciousness for a New Humankind 42
6. The Ecological Crisis and the Quality of Life 57
7. Some New Testament Foundations for a Respectful Approach to the Created Order 72
8. The Nature of Nature 85
9. An Eastern Orthodox Perspective of Nature, Man and God 100
10. The Captivity of Science : Science as Exploiter and Science for War 115
11. Scientific Temper : Time for a Resume before the Debate Resumes 123
12. The Religion of the Scientist 127
13. Heritage Versus Technology: Reflections on the Role of Technology in Shaping the Indian Identity 133
14. Heritage and Technology : In Harmony or in Conflict 148

Books by Mar Gregorios 171

Foreword

Metropolitan Paulos Mar Gregorios with his probing intellect and holistic vision of Reality has raised some fundamental questions regarding science and technology. During the period of his intellectual and spiritual maturity, he witnessed the phenomenal blossoming of the scientific and technological enterprise, from splitting of the atom to space travel, from information revolution to human genome project. His ruminations on the import of these developments for a new human civilization were expressed mostly in international gatherings of scientists, philosophers and theologians. One of the high points of his very stimulating interaction with them happened at the Massachusetts Institute of Technology (MIT) where in 1979 he chaired the week-long conference on Faith, Science and the Future.

While Mar Gregorios genuinely admired the dazzling brilliance of 20th century science and technology, he was sharply critical of the way in which contemporary western civilization made use of it. Hence his fundamental questions about 'the nature of nature', about human nature and destiny and about the possibility of a global civilization rooted in justice and peace, love and compassion, self discipline and self-sacrifice. In raising questions and suggesting answers he draws on three seminal sources to which he is personally attached, namely, the Eastern Christian Biblical-Patristic tradition, the spiritual-philosophical heritage of major Indian religions and the wisdom of the Asian mindset.

The Mar Gregorios Foundation (MGF) at the Orthodox Theological Seminary, Kottayam has been publishing the collected

works of Metropolitan in a series over the last 10 years. We are almost approaching the end of the series. The ISPCK in Delhi has been the co-publisher. We admit that the quality of printing and publishing does not always match the extraordinary quality of the Metropolitan's writings. However, within our limitations, the publication of his multifarious articles and papers in handy volumes has helped many students and followers of Gregorian thought.

Prof. Dr. Joseph P. Varghese, a reputed Geneticist and a long-time student of Mar Gregorios, has edited the present volume. The Mar Gregorios Foundation expresses its gratitude to him, to Rev. Fr. C.C. Cherian, Secretary of MGF, for the classification of the material and to all others who assisted in bringing out this very important work.

Fr. K. M. George
President
Mar Gregorios Foundation

Introduction

Metropolitan Paulos Mar Gregorios was a profound thinker and a prolific writer. Unfortunately all his thoughts have not been written down and documented for posterity. He was interested in all areas of human endeavor including arts and humanities, philosophy of science and religion, languages, culture and tradition, science and technology, not to mention theology, sociology , history, music and other subjects .But certain areas, like theoretical physics and quantum mechanics were closer to his heart. And his writings reflect his interest in these areas.

Most of the papers in this volume were written a quarter century or more ago in response to certain questions facing humanity, or as a review of the state of the art in Philosophy of Science, Science, Technology, or stating a humanistic position and an Eastern Orthodox perspective on areas such as the ecological crisis, quality of life and so on. Some chapters were presentations in conferences, some reviews or statements of position and a few, more serious papers.

The first chapter "Does Humanity have a Future?" was written in the background of the WCC Conference on 'Science and Technology for Human Development: The ambiguous Future and Christian Hope' which was held in Bucharest in June-July, 1974. In his characteristic style with subtle humour all the way through, Mar Gregorios comments on the views expressed by the developed, developing and the socialist East block countries but make it clear that global injustice and consumerism are issues to be dealt with. Without justice, who wants a future, any way? He asks by way of conclusion.

In the chapter on "Humanization as a World Problem" Metropolitan Gregorios comments on two approaches to Christian anthropology taken by St. Augustine and St. Gregory of Nyssa (both of the 4th century AD). Dwelling on the question of what is humanization; he delves deep into discussing a more fundamental question viz. What is man? He points out how the way shown by Gregory of Nyssa corrects the distortions in the other approach and emphasizes the fact that man is an integral part of creation and cannot be understood or saved in isolation from the rest of the creation. The redemption in Jesus Christ, he affirms, is a cosmic one and states that it is sheer pettiness to think that it is exclusive to any religion. In man's hands are wisdom, power and love. Man has the power to create and give, and in giving himself to his fellow beings, he finds fulfillment and growth.

Metropolitan Gregorios traces the outlines of the development of human consciousness in the chapter on "Emerging Consciousness for a new Human kind". He sketches the passage of human consciousness from the unverbalised awareness that one's body and mind were part of a whole which included the earth and the sun, plants and animals and so on, to the emergence of a verbalized consciousness. In order to grasp the nature of the problem facing an understanding of the human consciousness today, he further examines the dialectic between intrinsic and extrinsic evolution in the human species. In this context, he further deals with the growth in knowledge and ignorance and gives us an insight into Sri Aurobindo's analysis of ignorance in terms of a seven-fold self ignorance. He clarifies the position of the Christian tradition at this point and elaborates on the nature of truth and reality. Truth, in the Christian tradition, is compounded with mercy, love and justice. It is the truth-love combination that we have to experience in our consciousness. This requires the integration of truth with love, reality with compassion and reliability with righteousness.

The next chapter "Ecological Crisis and the Quality of Life: A patristic questioning of our triumphalist Anthropology" was written in the mid seventies after the publication of the Club of

Rome's "Limits to Growth". He analyses the causes of the crisis and examines the implications of some of the advances in biological sciences. The basic issue in the ecological crisis, as he bluntly puts it, is our conception of the relation between man and nature which underlies our science and technology. The paper is also a response to the (false) critique that the Judeao-Christian tradition is responsible for the wrong developments in science and technology which lead to mindless exploitation of nature and the resultant ecological crisis. He advocates a sacramental understanding of reality in communities as a possible solution. He pens down five thoughts by way of conclusion. One of his assertions: "mankind is a middle reality between God and the world, participating in both poles of reality. That is, in the energies of the eternal, unchanging, trans temporal-spatial reality of God and in the perpetually changing time-space reality of the created order. It is only by remaining in the tension between God and the world that he can remain man and grow to the fullness of humanity".

"Some New Testament Foundations of a Respectful Approach to Nature" was written in response to a speech made by Shri Sundarlal Bahuguna on the relationship between man and nature. Metropolitan Gregorios reiterates his pet theme regarding human redemption once again that it can be understood only as an integral part of the redemption of the whole creation.

The next two are possibly the most beautiful chapters in this volume. The paper on "Nature of Nature" was presented in a WCC Consultation on "Nature, Humanity and God" held in Zurich in July 1977. In his discourse on the topic he makes it abundantly clear that the term nature to mean the non-human part of creation is totally alien to authentic Christian tradition and understanding.

In the "Eastern Orthodox Perspective of Nature" he examines the nature of matter, the nature of time and man's place in the universe and emphasizes how the term nature is misleading. He also lays down certain practical implications of the Eastern Orthodox perspective. In this paper, he vividly describes life in the community of spirit and participation in the living tradition of Christ. Let me quote a short paragraph from the text:

"The community of the Church has its own understanding, language and action, which always transcends the rational. No final conceptual apprehension of reality is available to the community or to any of its participants. The best mode of apprehension and expression is the Eucharistic act. All dualities are transcended in this act of union between the Creator and the creation, through participation in Jesus Christ the incarnate. Time and space are also transcended in this act, where eternity breaks into time and transforms it; where union is achieved with "all the saints" in space and time; where matter is the bearer of the spirit, the Bread of Life; where God, man and the creation are united in one act of mutual self-giving, where the creation is offered up to God in self-offering and where God offers himself to the creation through the body and the blood; where the world is transfigured to bear witness to the glory of God; where the subject-object dichotomy is overcome in the act where the offering, the offerer and the one to whom the offering is made are united in love; where reason and the language of reason merge into the act of love; where memory and hope bring the past and the future together into the single moment of present eternity ."

The "Captivity of Science" is a critique of the science establishment and scientism. He also draws our attention to the gross injustice in the use of money for R&D on a global scale. In "Scientific Temper" and "Religion of the Scientist" he raises several questions regarding the unethical practices in science and the nexus between military, industries and banking establishment in determining research priorities.

Finally, in the last two chapters on "Heritage versus Technology" and "Heritage and Technology: In Harmony or in Conflict" Metropolitan Gregorios answers certain questions raised by the former Prime Minister of India, Shri Rajiv Gandhi in his inaugural address of the Diamond Jubilee Celebrations of the Indian Philosophical Congress held in 1985 in Hyderabad. He examines the question if there is an intrinsic conflict between our heritage and the new technologies. He also deals in detail with the predominant schools of thought in the Philosophy of Science

in the West. He concludes the paper emphasizing the need for assimilating worthy elements from all traditions and religions in postulating our policies for developments in science and technology.

It is our fervent hope and prayer that our people would read this book and gain an insight into the thoughts of the late Metropolitan Dr. Paulos Mar Gregorios regarding contemporary issues.

Dr. Joseph P. Varghese
Kottayam

CHAPTER 1

Does Humanity Have a Future?

Conclusions of a Five Year WCC Study on Science and Technology

When in 1969 the World Council of Churches began a study on "The future of man and society in a world of science based technology", many people thought it was part of the diversionary tactics of the West, to draw attention away from the burning issues of justice in society. Perhaps, at that time it partly was. For, the 1966 Geneva Conference on Church and Society had made even the World Council of Churches somewhat aware that there was global injustice that the rich of the world were oppressing the poor and exploiting them, and that the north Atlantic countries had a lion's share in the guilt of oppression and exploitation in the world today.

If the WCC and the rich western Churches which form the bulk of its financial and personnel support were conscientiously to follow the lead of Geneva 1966, the Churches would probably have undergone severe persecution in all countries. For, to expose the pattern of oppression and exploitation in the world is to invite persecution from the powers that be.

So in a sense, when the WCC's fourth assembly at Uppsala in 1968 picked up "Development" rather than "international justice" as its main emphasis for the coming years, the

conclusion was easy to draw that global justice is still a hot potato, too hot indeed for the WCC to handle. In that sense it was legitimate that the Department of Church and Society, which organized Geneva 1966, went on after Uppsala 1968 to launch a five-year study programme on "The Future of Man and Society in a World of Science-based Technology" rather than on the "Future of Man in a World of Growing Global Injustice."

The study programme concluded with a big world pow-wow of scientists, theologians and sundry other professional conference-goers like the present writer, held at the Theological Institute of the Romanian Orthodox Church in Bucharest (June 24 to July 2, 1974), on the topic "Science and Technology for Human Development: The Ambiguous Future and the Christian Hope."

Despite the bombastic title, the conference managed to keep up the fairly mediocre standards of most WCC conferences. There was a flood of information, a bevy of luminaries, and a sickening torrent of words - all as usual.

Lynn White's wry, witty clever speech on "Technology and the Future of Compassion" did not get the attention it deserved partly because the man looked too chubby, rotund, funny, and complacent in the face of the enormous illness of humanity for which he was prescribing active compassion towards the whole universe as a single remedy. In sharp contrast was the African Jesuit Professor Mveng's (Cameroun) paper on "Cultural Values and the Future of Technology". American wit was no match for African wisdom. Seldom have I seen a French speech make so profound an impression on a largely English speaking conference. The sources of its wisdom lay more in African traditional lore than simply in the so-called Judaeo-Christian tradition. He spoke not only of the integral relation between man and cosmos in traditional African lore; he insisted that African culture taught men and women to read and understand the book of human destiny

and the book of the cosmos in a single optique, and to discern one's true allies and real enemies in the world of reality.

And then, came the fable of Evu-Mana, which gripped the conference; this was the African counterpart of the story of Adam and Eve. The story of a woman who was fishing in the forest for little fish, catching nothing after a whole day's toil; coming upon a gazelle that had just been arrowed down; taking the meat home, having a feast. A secret benefactor (Technology?) did this for her every day, so that she was no longer poor. Then, after a few days, the benefactor appears to her and asks to be taken home with her to her village, provided she could feed the benefactor. She agrees; he insists on getting inside her and being carried home in her stomach or womb. Once in the village, the benefactor inside her gets hungry and wants to eat. His appetite is insatiable. He eats and devours, until he consumes the whole village, all its people, animals, everything living. Finally, his appetite still unsatisfied, the benefactor reveals his true identity to her. "I am hungry, hungry, hungry. I am Evu - Mana the demon of Death; my appetite is insatiable. Now you alone are alive; I must eat you too". Evu-Mana devoured the woman.

Evu-Mana, Mveng said with the simplicity of wisdom, is not technology, but the greedy demon of consumerism, that possesses the body of humanity and finally devours humanity itself.

Despite the profound wisdom and truth of his analysis, Fr. Mveng's remedy - the merging of technology and culture - left the conference unsatisfied.

Prof. George Borgstrom of Michigan State, formerly of Sweden, struck a distinctive note of prophetic passion, pleading "Back to Reality - a Basis for Ethical Guidance". He spoke convincingly, about "the Protein Empire" built on prevailing trade patterns, sucking all the nutrients of the world, in the shape of grain, oil-seeds, and sea-food, into the well-fed, but

voraciously hungry stomach of the west. He castigated those who seek to palliate the hungry world's misery by verbal tranquillizers, religion being most guilty at this point. The Soaring Sixties have now given place to the Sobering Seventies. We have been deluding ourselves with dreams of a world of plenty, while creating an oasis of affluence in the midst of a vast desert of penury. The affluent world has treated the rest of the world as a market to be tapped or as a field to provide them with food and fibres. We need now to see the world as people. The famous Kennedy question has to be enlarged. "Not what the world can do for us, but what can we do for our world?"

Science and technology in the service of consumerism, of culture, or of compassion - that seemed the way the question was posed. To many from the two-third world, that way of putting the question seemed too paternalistic, and occidentocentric.

The weakness of the conference lay precisely in that. At Geneva in 1966, the voices of Africa and Latin America were the loudest, and the West was put down to a guilty silence. At Bucharest in 1974, care seemed to have been taken to make the western voices loud enough not to be unheard. There was Margaret Mead, the President elect of the American Association for the Advancement of Science, loud enough to be heard around the world; Dr. Magnus Pyke, Secretary of the British Association for the Advancement of Science speaking in that inimitably entertaining Oxbridge donnish style with wit and cadence, but in vain, to convince us that science and technology were totally innocent and had done so much good to all around; Peter Odell (Oil and World Politics) himself *persona non grata* to the oil companies, strongly pleading that the multinationals were not the villains of the piece; the giant economist Kenneth Boulding telling the conference with astonishing insensitivity that exploitation was only a minor problem. Add, Lynn White, President of the American Historical Association, Langdon

Gilkey of the University of Chicago Divinity school, World Council patriarch Willem Visser 't Hooft; you can hardly complain, as one perhaps could at Geneva 1966, that the white western world was not adequately represented on the platform.

In contrast, the speakers from the two-third world appeared mild-mannered, quiet, unstrident. Prof. Sam Parmar of India, the co-chairman of the conference, was low-key even in some of his most penetrating remarks. Hamilcar Herrera's (Bariloche Foundation. Argentina, Director of Special Study on a Latin American world model in response to the Limits to Growth report of the Club of Rome) erudition was too vast to gain attention. Prof. Warwick Kerr of Brazil, spoke about his own personal imprisonment and torture. Prof. Nathan Shamuyarira of Tanzania spoke quietly about Africa's determination to be self-reliant. Prof. Philip Shen of Hong Kong seemed to have been specially chosen to represent a conservative Asian view. On the whole the two-third world, including Prof. Mveng, gave the impression that little purpose was served by branding the West as the culprit , when our own houses were not very much in order.

The socialist countries of Eastern Europe also made very little impression on the conference. Minister Mircea Malitza, Counsellor to the President of Romania, sounded blandly western, almost consumerist, but eloquent on socialist achievements in Romania. And eastern Europe seemed dead scared of all this criticism of consumerism, perhaps because they are only barely getting into it now. There was little response from European socialist countries to the humanist critique of science - technology.

On the theological side, the confrontation was not so much between science and theology, as between the ancient eastern tradition and the younger western tradition. Scientists were, in general, not prepared to expect much from western theology. And there was no major western theological presentation. The theological working group's report came under heavy fire. No

Black Theology, no Liberation Theology, but just more of the old Bland Theology.

Only Charles Birch of Australia, the other co-chairman of the conference, produced a report from his group which was both substantial and ample in size, full of bold fresh analyses and insights.

The reports, it is hoped, having gone through various stages of WCC processing will make some difference to the Nairobi Assembly this year (The preparatory work for Bucharest was exceptionally good).

One last caveat. This writer was struck by the political naiveté of the experts in science and technology. When will we get that dialogue going, between science - technology and economics - politics? People sometimes seemed to assume that since the experts are so compassionate and full of good will, the catastrophe can be avoided, if everyone just gets in and does his or her little bit along with the experts. At other times, the facts seemed to question the very assumption that humanity has a future at all.

Without justice, who wants a future, anyway?

CHAPTER 2

Humanity, Nature and God

Some Discussion Questions

1. Nearly all traditional forms of thought have dealt with three realities. God, humanity and the world. Our secular civilization has basically learned to think in terms of two realities - man and the "external" world. There have been other precedents of binary thinking, but not just in terms of man and world as the two self-existent realities. The ancient Chinese system thinks in terms of Ying and Yang, but that is not the same as Man and World; nor is the ancient Hindu *Sankhya* System which thought in terms of *Purusha* (person) and *Prakriti* (non conscious nature).

   (a) What are the consequences of the modern binary thinking of self as knowing subject and the world as known object? (b) Is this binary conception essential to science and technology? Is it logically sustainable? (c) Is it sustainable from a Christian perspective?

2. Even taking reality as man-world (without God) it is still possible to hold to a unitary view or a binary view. The unitary view is expressed in Marxist materialist philosophy as well as in western idealist philosophies (e.g. Hegel); but modern pragmatism, which may lie much behind of modern science, may be unreflectively holding to a binary

view. The debate has now emerged in the west as the inclusive or exclusive view of nature; i.e. nature as including or excluding humanity. Can this debate be resolved by science itself? Whose job is it to resolve this debate? Of environmentalists alone? What can theology and the philosophy of science contribute to this debate?

3. Science claims to make no assumptions about the origin of matter-energy or about the ground of existence as such. Do scientists, however, often unreflectively assume that the world and man existed and evolved by some autonomous principle and process? Does science promote an ethos where people assume that existence as well as evolution of that which exists can be explained without reference to anything "outside" or "underneath" existence and evolution? Do scientists with a Christian faith manage to find an intellectually satisfactory meaning for the doctrine of creation and creator-creation relationship?

4. Christian theology sometimes makes the claim that nature is also to participate in and benefit from the redemption of humanity in Christ, on the basis of scriptural passages like Romans 8, and the teaching about the cosmic Christ in the Epistles to Colossians and Ephesians. Can this doctrine be re-interpreted in a manner that does justice to the scientific technological enterprise of humanity and in relation to the current ecological crisis?

5. How do other religions and ideologies interpret reality? Have western Christianity and western secular thought to learn something from these sources? The claim has often been made that the cosmology of East Asian religions (primarily Taoism, Buddhism and Hinduism) and of primal cultures and ancient civilisations would be more consistent with reality as understood in modern science than the western cosmology of Judaism, Christianity and Islam, which tend to emphasise the distinction and difference between God, Man and the World, rather than

their unity and inter-relatedness. To what extent can this claim be documented?

6. Is there a difference in conceiving the relationship between God, humanity and the universe, between the eastern and western traditions in the Christian Church? If there is, how and when did this difference emerge? Can they now learn from each other and correct each other?

7. The idea is now being advanced that non-human existents like animals, trees, and even mountains and rivers have the right to exist and not be destroyed by man. How far would you go on this line? Would you make the rights justifiable? How?

8. Does science itself have any clear and consistent hypothesis about the relationship between humanity and the universe? Between subject and object? Between concept and object or a thing and the idea of it? Can this be stated?

9. Do modern developments in science - especially in nuclear physics, in astro-physics, in biology, in cybernetics, in quantum theory and in the theory of relativity, fundamentally alter our understanding of the man-world relation? How? What new understandings are available from these developments about part-whole relationship, and about subject-object relation?

10. Marxist philosophy not only rejects the notion of God but regards such a notion as an obstacle to the understanding of reality.

In fact, it seeks to understand the whole of reality as composed of "moving matter in its manifold forms, eternal in time, infinite in space, in constant law-governed self-development" (S.T. Melukhin, *"The Dialectical, Materialist Conception of Matter" in Philosophy in the USSR*, Progress Publishers, Moscow, 1977, p.43). The same author speaks of "the absoluteness, the substantiality and eternal existence of matter" which follows certain universal laws and is organized as system of varying

levels of complexity, which are themselves interconnected, and constantly undergoing transformation, in accordance with the universal dialectical laws.

How can this way of perceiving reality come into dialogue with the Christian understanding of God, humanity and cosmos?

CHAPTER 3

Humanization as a World Problem

It was a comparatively noiseless break-through that the World Council of Churches made recently in organizing a world level dialogue between Christians and Marxists. The break-through was not reached in terms of agreement between Christians and Marxists, but the fact that such dialogue moved from the realm of possibility to reality.

The Christian side had formulated the theme, in the usual clumsy and unclear manner, as "Trends in Christian and Marxist thinking about the Humanization of Technical and Economic Development." Very soon objection was raised about the theme - Is humanization something to be brought in from the outside to bear upon something else which is inhuman called "Technical and Economic Development?" Certainly not. Development, whether technical and economic, or cultural and spiritual, is itself a major element in humanization.

That raises a question: What is humanization? It is an - action word derived from the adjectival form of *man*, it means making man *human*. How can we give any positive content to the notion of humanization without knowing who man is? If you say that he is simply a biological species, then you have no problem of humanization - since the species is already there.

But, precisely because man finds himself confronted with the need for humanization, it is clear that man is not yet man.

And in order that man truly becomes human, we need to have a basic orientation, if not a model of what man should be, at least a tentative contour of what man is and has to be.

Here, some Marxists are anxious to talk to intelligent Christians. The more creative Marxist intellectuals are becoming convinced that dogmatic Marxism (no more than dogmatic Christianity) cannot answer the question: "What is Man?" in a manner that will be useful even for the immediate future.

The question about the nature of man also appears to be the central thrust of the dialogue which is now breaking out everywhere - among western Christians whether Protestant or Catholic, between western Christianity and eastern Christianity, between Christians and secular men, between Christians and Marxists, and between Christians and adherents of other religions. But dogmatic Christianity too does not seem to have an adequate answer to the question: "What is Man?"

The Question and its Parts

The question about what man is refers both to his finitude and to his transcendence. It is for this reason that the question seems so hard to tackle. It has both a phenomenological and an ontological aspect.

Immanuel Kant, the intellectual father of the modern era, once said that true universal philosophy is concerned with four fundamental questions:

1. What can I know?
2. What ought I to do?
3. What may I hope for?
4. What is man?

In his *Handbook* (to his lectures on logic), he suggested that the first question is the concern of metaphysics, the second the realm of ethics, the third that of religion and the fourth that of anthropology."[1]

Kant's whole philosophical enterprise was an attempt to answer these questions. He thought that the fourth question : "What is man"? is the inclusive question, and that the other three simply seek to mark out some of the limitations of man in his finitude. Martin Buber, in his inaugural lectures as Professor of Social Philosophy at the Hebrew University in Jerusalem (1938) accused Kant, however, of not having tackled the question "What is man?" because of the indefinite scope of the question.

Heidegger, also criticizes Kant for not having dealt with the fundamental question about the being of man.[2] His own project is to seek an answer to the question of fundamental anthropology through the method of fundamental ontology.

But the scope of the question is more than staggering : It is almost paralysing. As Malebranche puts it:

"Of all human knowledge, the knowledge of man is the most deserving of his study. Yet, this knowledge is not the most cultivated or the most developed which we possess. The generality of men neglects it completely. And even among those who busy themselves with this knowledge, there are very few who dedicate themselves to it - and still fewer who successfully dedicate themselves to it."[3]

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[1] Quoted by Martin Buber in *Between Man and Man*, Fontana 1961 p.149.

[2] *Kant and the Problem of Metaphysics*, Eng. Tr. James S.Churchill, Indiana University Press, 1965.

[3] Quoted by Buber, *op.cit.* p.149.

The effort to subdivide the question into its constituent parts itself involves the begging of some questions. If we say that the three subsidiary questions are, as Kant proposed, what can I know, what ought I to do and what may I hope for, this implies that man is to be understood primarily as a knower, doer, and hoper. That he is all three, and that these three constitute a major part of his existence, cannot be doubted. But are these his constitutuent features? Or can these three, his knowing, doing, and hoping, be better understood as instrumental to something else - namely man's search for his own being, which is more than simply knowing, doing and hoping?

The Question of Methodology and Criteria

This raises immediately the problem of the method by which we seek to answer the question: "What is man?", and of the criteria by which preferred answers are to be tested. Shall we take a "history of ideas" approach, and root our ideas solidly in the past, or shall we take a phenomenological analysis of the *Dasein* of contemporary existence, or again shall we be boldly speculative and use our freedom to envision the future of mankind by our own discerning choice?

Whichever way we choose, there cannot be an external authority or criterion by which we can fully validate our choice. We cannot be exhaustive in our analysis of the past of man's ideas about himself, and even if we were, we would be confronted with the need to choose between varying positions taken in the past. There is nothing authoritative about the past that can be fully normative for the present and the future. Besides, if the analysis of the past is not related to the present and the future, what use is it?

Neither is there any guarantee that any phenomenological analysis of man in his present existence can be absolutely free from cultural pre-suppositions. Here is the fundamental difficulty of Husserl's phenomenological method. The world

obtained by the analysis of Sartre's consciousness need not be identical with the world which a Japanese Zen Buddhist may have in his consciousness. And no criterion exists to arbitrate between the two. Both consciousnesses are the consequences of particular collective and individual histories, and are also coloured by different systems of education, different personal and cultural fears and inhibitions etc.

It does not seem possible, however to envisage the future without being partly conditioned by the past and the present. No man is totally free from the formative power of personal and cultural history, even when he claims to be so. One speaks therefore about the future of man, fully aware that one is so conditioned. The authenticity of the vision can be tested only by the degree to which it commends itself to others.

Let me therefore, from the outset make it clear that I speak with no authority, but simply as one whose cultural and personal history includes the South-East Asian world which gave birth to Hinduism and Buddhism, a spiritual rootage in Eastern Orthodox Christianity, and the brainwashing of a western education, as well as a somewhat unique personal history which creates its own inhibitions and aspirations.

Two Christian Approaches to Anthropology

We shall take here, in order to provide some rootage in the past, just two ancient Christian attempts to draw the contour of man. These men are chosen both because of their great influence on Christianity and human culture, and because of the interesting contrast between them which places us before certain choices. They are St. Augustine of Hippo and St. Gregory of Nyssa.

Augustine found the question of the psalmist an existential one for himself - "What is man, that thou art mindful of him!" Since his own concern is with existential self-understanding, he rephrases the question in the first person: *Quid ergo sum, Deus meus? quae natura mea?*, "So what am I, my God, what is

my nature?" Precisely because he could not understand man as something given, a normal part of the scheme of things, he had no method of answering that question, except by addressing it to God himself.

And, what answer did he find? His own personal pre-occupation from his very youth was with the problem of evil, evil in the world, evil in the self. That was the central question in that disintegrating world of fourth-century Rome. And in answering the question about the nature of man, he also answered his prior question about the origin of evil.

His first love, Manicheism, had sought to find the source of evil in a permanent principle of evil - in an eternal evil God opposed to the good God. In his earlier works as a Christian to combat this, is his main pre-occupation - to affirm the sovereignty of the good God by denying a second eternal God. And he argues - if this latter God, the God of evil, is capable only of evil, then he is not God, for God is free. He thus denies an unoriginate eternal principle of evil, and locates the origin of evil in the freedom of the will in the created order.[4]

In his controversy with Pelagious and his disciples, however, Augustine had to withdraw much of what he said about free-will, for his anti manichean writings had been used by the Pelagians to argue against Augustine's own doctrine of grace. And so in his *Retractions* (1 : IX) he withdraws much of what he had earlier said about free-will. It is this circumstance that made him reduce freedom to a neutral, medium kind of good and not central to man's nature.

But Augustine, regarded evil himself as central to man's nature. For he had fought hard against the evil of concupiscence in his own soul, only to find himself getting more deeply involved in it. So he traces the origin of evil to the free-will,

[4] Augustine's view of the origin of evil is a faithful summary of what the Cappadocian fathers taught.

making evil an integral part of man - of *natura mea,* and thus of human nature itself.

Humanity is thus a *massa damnata,* revoltingly vile, man being mis-oriented in his very reason by his passions. Desire precedes thought. The will goes before the mind, deflecting and distorting it. *Partum mentis praecedit appetitus.* It is your love which can decide whether your mind is on the right track or not. There are two fundamental choices for love - Jerusalem, the city of God, or Babylon, the city of the earth. The *natura mea* always inclines me to Babylon, the worldly city. Only the grace of God can lift my love up to Jerusalem.

"My weight is my love, thereby I am borne, withersoever I am borne. We are inflamed; by Thy gift (grace) we are enkindled; and are carried upwards; we glow inwardly, and go forwards .... we go upwards to the peace of Jerusalem."

Augustine, thus dramatized what is a biblical insight in St. Paul's epistle to the Galatians:

"The desires of the flesh are against the spirit, and the desires of the spirit are against the flesh, for these are opposed to each other, to prevent you from doing what you would." *Gal. 5:17.*

And yet in that dramatization, he was laying the foundations of a doctrine which has become deeply entrenched in western Christianity as well as in western culture, that evil or sin is an integral part of human nature. This ontologization of what was but a phenomenological observation in St. Paul, has plagued western Christianity ever since. For St. Paul, sin is not a part of man in his created essence, but rather an enemy that has entered into humanity from the outside, through the disobedience of the first Adam. Of course, Augustine would agree with that. Yet, he saw fallen human nature as decisively normative for his understanding of man. In Augustine, nature is the result of the Fall, not of creation.

In western Christian anthropology, the distinctive thing about man is that he is a sinner by nature. Nothing good can come from him by nature. Only grace can produce the first movements towards the good. By nature he is not free. Grace coming from outside humanity, outside nature liberates him to will the good and thus restores to him the limited freedom of being able to do good.

One feels embarrassed by the degree of presumption that is required to engage in fundamental criticism of such a towering genius of humanity as Augustine. And yet, without exercising that freedom, one becomes paralyzed by the over powering authority of obvious error. So, the following criticisms of Augustine are proffered in the interest of starting a discussion between east and west within the Christian Church which has been long overdue. Here, they are in the form of five theses:

1. The opposition between Jerusalem, the city of God and Babylon, the city of earth, has been posed by Augustine too undialectically to permit its remaining faithful to the biblical tradition. A false opposition is created here between this world and the world to come. The world to come has, according to the biblical view, come into this world in Jesus Christ, pervades it and grows within it, transforming it from within. By failing to recognize this dialectical tension, and by making the two realms disjunctive, Augustine has unwillingly laid the foundation for the unfortunate choice between world-affirmation and world-denial in western intellectual and cultural life. Overcoming this disjunction is of primary significance to a relevant anthropology today.
2. By making human nature totally devoid of the good and conceiving grace as something supernatural entering nature from the outside, Augustine has been unwittingly responsible for the Christian Church's false claims to exclusive possession of the good, and the despising of other religions and cultures - which still remains a fundamental

problem of western culture. By conceiving man's essential nature to be sinful, it has been unable to have a positive evaluation of man's destiny *as man* - secular or religious - in the material creation, to accept man, at least in part free to shape his own nature and destiny in this world. The opposition between nature and grace continues to plague western theology, even in a new theologian like Karl Rahner.

3. By making sin the central problem of man, western Christianity has been caught in the trap of being concerned primarily with the salvation of the individual, to the neglect of his corporate vocation, to be the bearer of God's name in history. It has thus been pre-occupied with the problems of forgiveness of sins and justification by faith, which are both preliminary to the true vocation of man to be transformed into the image of God, transforming his environment in that process. Deliverance from sin is not enough. The vocation to shape the world belongs integrally to the Christian message.
4. By focusing on the salvation of the individual from sin, Augustine laid the foundation for thinking of the Church as a collection of saved individuals, rather than as the corporate body of Christ by participation in which the individual man experiences not only forgiveness of sins, but also access into the presence of God. A relevant Christian anthropology today has to grant primacy to man's corporate existence and the structures of society, and only in that context view the problems of personal existence.
5. By thinking of the sacraments mainly in terms of a *verbum visible* and as a vehicle of grace to the individual, Augustine made possible the obscuration of the Eucharist as the central act of the Church with a double movement - the corporate self-giving of the Church to her Lord in loving adoration, and the self-giving of the Lord to the Church in the body and the blood. The recovery of an authentic

sacramental practice in the Church is necessary to revalidate matter in Christian thought, and thus to train Christians to take the incarnation and this world seriously.

Western anthropology finds itself caught in the terms of these Augustinian deviations, even in their denial of them. Correctives are to be sought outside the western tradition, since new alternatives have to be posed to come to grips with man in his complex reality. Ecumenical discussion should soon pay attention to this aspect.

One such corrective can come from Augustine's contemporary, St. Gregory of Nyssa, from whom Augustine seems to have derived many of his ideas, though not directly but through Jerome, Ruffinus and Ambrose. I shall, here refer to seven points of Nyssa's anthropology in the form of succinct theses.

1. Man is an integral part of creation, and cannot be understood or saved in isolation from the rest of creation. The creation was made for man and finds its fulfillment in him.
2. Man is distinguished from the rest of creation by his "ruling power" over the rest of creation. Man is thus born to be Lord of creation - this is his nature as the image of God. Tool-making is an essential aspect of the Lordship of man, and this is why he is born weak and defenseless, but has to acquire his tools and weapons by subduing animals and metals.
3. Man's mind, which rules over him (the hegemonikon) works through the senses, which in turn operate through the body, and therefore the three are inseparable, and all three (mind, body and sense) are to be saved as integral parts of man.
4. Man is created in the image of God. His nature is therefore to be like God, participant in all good. Sin is extrinsic to his

nature, an accretion from the outside. His nature is participation in all possible good. There is no limit to his potentiality for good.

5. The basis for participation in all good is freedom from necessity, for that which is not free is not virtue. Man's nature has therefore to be freely achieved, by creative activity and not simply by passively being moulded, or by grace infused from outside.
6. The basic distinction between God and man is that God is unoriginate, while Man is created. God is beyond time, not subject to change as time-creatures are. Man is originate, and in time, and therefore has constantly to change - i.e. he is a historical being, in the flux of change, always at the point of intersection between a past and a future.
7. Man in his fundamental essence is corporate, the body is the principle of individuation. His vocation therefore is to be a corporate body - the body of Christ. Perfection itself belongs to mankind as a whole in the final recapitulation, when evil shall cease to exist even at the pragmatic level.

The subtlety of St. Gregory of Nyssa's anthropology can be grasped only by apprehending his analysis of the creation, man, and the God-man Christ Jesus in their various relations to God.

God is freedom. That is what the transcendence of God ultimately means. He transcends all determinants, physical, psychological, moral or conceptual. He is free also in His immanent relations to the cosmos and to Man.

The world is no emanation from God. It is created, i.e. the principles (*aphormas*), the causes (*aitias*) and the forces (*dunameis*) of all that exists are set in motion by God's will. The creation is thus the realization, or concretization of God's will. "The will of God is, so to speak, the matter, the form and the energy of the universe, and everything in the universe is subject to it." This according to Nyssa, is the Christian understanding

of God's immanence in creation. Not that God's being is in the cosmos (pantheism), not that the universe is in the being of God (pan-en-theism), but rather that God's will has become the cosmos. And, therefore, while we can speak of God's immanence in creation through His will, precisely because the will of God is the being of the universe, the universe itself is transcendent and free, beyond our conceptual determinants. The universe is thus a dynamic being. It is God's decision, will and purpose that gives it motion. The immanence of God, thus serves both as the principle of cohesion and as the motor of evolution.

The cosmos is the dynamic concretion of the will of God and man is an integral part of this cosmos. But man is more than that. He is a participant in the very *phusis* or dynamic nature of God. God's grace is ultimately, His choice to make man participate in His nature. The two creations - the creation of the universe, and the creation of man - are both acts of God's grace. It is this double grace - the grace of simple creation by will and of the second creation after his own image, - that constitutes our being as body and soul. Grace is thus not opposed to nature, but is the constituent of nature.

The mind, or spirit, or *nous*, creative mental activity, constitutes the difference between the rest of creation and man. In man, God's transcendent and free immanence becomes present in a special way. And since this is the essence of man, human nature cannot be conceptually determined. It breaks out of all confining limits except that of creaturehood, for even historical existence is one day to be transcended.

The transcendent divine immanence in man is neither static nor self-evident. It is a free, dynamic presence, and is realized by man to the extent to which the soul or the constructive essence of man, becomes transparent to the reality of itself.

God's freedom functions in the cosmos as an immanence of which the universe is not consciously aware. In man, there

is the possibility of his being consciously aware of the Divine presence in him. In the God-Man Jesus Christ, the awareness of man's self-identity as the divine Immanence became fully transparent to the divine transcendence of the Father, and this is the reality of being the image of God - the transparence of the image to its proto-type. It is in this transparent stance that the transfiguration of man takes place - as St. Paul says in 2 Corinthians 3:12-18.

Man thus, according to Nyssa, is an earth-born organism destined to become transparent to the reality of the transcendent God and to transform the creation by his free creativity to become the bearer of the Good.

Transition to Our Time

But, what indeed, does all this have to do with the issues confronting man today? Where is the transition from this abstract ontological analysis to contemporary problems? Perhaps, the best exponent of patristic thought in relation to current problems is that great western Christian genius Pere Teilhard de Chardin. His thought seems to be in direct continuity more with Nyssa than with Augustine.

The idea that plays a central role in Teilhard's thought is that of "hominization" or "humanization" and "cosmogenesis" or "planetization". There are two fundamental faith-affirmations which underlie this vision of history as humanization and cosmogenesis.

1. Evolution is infallible; it cannot miscarry; it must go through to the end of what it has set out to achieve, despite many failures along the way. Industrialization is the consequence of evolution.

2. This end already exists - as point Omega, a personal centre able to sum up all consciousness within itself, and finally to unify the human super-organism.

The whole of the history of creation forms one single movement forward of God's dynamic will immanent in the universe, according to Teilhard. Consciousness, which becomes most manifest in man, goes back to matter itself for its origin. All sciences deal with aspects of this movement forward - Astronomy, Palaeontology, and Geology dealing with the history of material creation, Biology with the history of life, World history with the dealings of men with each other and with their environment, and Church history or holy history dealing with the transcendent God's breaking into man through Christ Jesus and the Holy Spirit.

The question then is about the orientation or direction of the whole process, and particularly about the goals for man. Point Omega as a goal does not suffice to orient, without greater amplification.

Teilhard finds the orientation by an analysis of the process of movement. He finds a dialectic in the total process between death and life, between the tangential or external energy which governs the physical and chemical relations of the elements to each other on the one hand, and radial or internal energy, which is really psychic energy drawing every group of life forward towards greater complexity and centricity. The physico-chemical movement is subject to Carnot's second law - the increase of entropy, the running down of the universe, the drift to death and non-being. The psychic energy of consciousness overcomes this tendency to death by the creation of life, which by greater complexity of organization and by being more centred, is able to make the particles of matter function in such a way as to move forward to hominization or cosmogenesis.

Thus, according to Teilhard, there is in the stuff of the universe, and not merely in man, a growing force of desire and invention, very feeble and unsure at first, but growing in intensity as time progresses. This, then becomes life, "some thing that arranges, converges, becomes concentrated,

interiorized, develops corpuscles" through something else that "disarranges, diverges, expands and loses its corpuscles." It is this process which we call evolution.

The appearance of man in this evolutionary continuum creates a new situation, precisely because of the existence of *nous* or human consciousness. It is no longer the body that evolves, but the sphere of the mind - the noosphere. The fundamental direction is the same - namely increasing complexity and centricity. The region and the technique of evolution has now radically shifted.

The new fact is that it is no longer the body that evolves, but the human mind, moving forward towards more complexity. Complexity means not merely greater diversity, but also a multivariety of levels and currents of relationship. Centricity means more centred and therefore more wide-embracing and more consciously directed process of human development. It is no longer simply the original impulse within creation that directs the universe towards its fulfillment centred in point Omega. A part of the stream of evolution, namely human consciousness, becomes capable, not only of comprehending the process that gave birth to it, but also of directing it towards freely chosen goals. "God makes things make themselves ", says Teilhard.

It is in fact no longer evolution, giving rise to a multiplicity of forms of life. A new process has begun with man - namely that of involution. Man finds himself confronted not only with the task of liberating himself from the evolutionary stream that carries him forward through the double process of expansion in diversity of species and concentration or selectivity in survival but he is also called upon to gather up the multifarious universe and bring it under centred and directed control.

Man is no longer the plaything of the reproductive urge which produces indiscriminately and the fact of death which eliminates the unfit. He assumes control of the mainstream of

evolution by being able to transcend it and transform it. Science and technology thus become the instruments of salvation. Economics and politics become part of the activity of increasing the centred complexity of a pluralistic world. Human creativity goes forward through not only science and technology, but also through the production and distribution of new goods, and the organization of power in society.

Human culture itself is influenced by this process. Changes in the pattern of production and distribution and in the organization of power radically alter the way of life, thought and action of men - their attitudes and aspirations included.

Thus, Teilhard becomes the exponent of a new way of looking at life or existence. History is now unified into one vision that comprehends the history of the universe and the earth (palaeontology, geology), the history of matter (the physico-chemical sciences), the history of life (biology) and the history of man (history, including science and technology, politics and economics as well as culture).

History, thus becomes the magnificent all-pervading movement of all existence in its proud though painful march towards fulfillment, and here in this process is where modern man seeks his own fulfillment or salvation. As Montuclard says:

"Modern man is convinced that history has a liberating part to play as regards to humanity. To him, history is the mediatrix of salvation. And if he has no religious faith, he carries this conviction to the lengths of believing that it is up to history alone - that is to say, for human effort inserted in the historical process - to secure for men, through justice, freedom and solidarity, the deliverance that they seek .....

There are in some men a faith, a hope, a sense of the future, and at times an overwhelming vision of the historical situation from which they can draw self-control, freedom of thought and action, courage, and initiatives. What did they have to do, in

order thus to be "saved"? No more than enter actively into the current of history?"[5]

It is this hope and trust in history and in the human effort to be inserted in human history, that constitutes the common ground for many Christians, secular humanists, and Marxist humanists. It is on this basis that they seem willing to enter into a dialogue about the humanization of the world.

Several Questions

Any Christian is tempted to ask a few questions to himself at this point:

1. What is the ground of this great hope in history? Does history itself provide the ground for such hope? Has not history betrayed men in the past?
2. Does this hope not create the false idol of an utopia on earth which man can create by his own effort? Does not the Christian faith preclude the vision of such a paradise on earth in history?
3. Does this hope not eliminate the need for any specific faith in God, and therefore make the Church and its message totally irrelevant?
4. Where does God fit in all this? If man can achieve the kingdom by his own efforts, does this not make God unnecessary and obsolete?
5. Is this all not too optimistic? Why is there no realistic appraisal of the fact of sin or evil which also exists in this evolutionary history? How did it originate? What is the function? How can it be overcome?

We may have to go beyond Teilhard in seeking to answer some of these questions. But in some cases Teilhard himself has pointed the way forward.

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[5] From "La Mediation de l'Eglise et la mediation de l'histoire", in Jeunese de l'Eglise. fasc. 7 entitled Delivrance de l'homme, quoted in Olivier Rabut, Dialogue with Teilhard de Chardin, p.169.

1. The Ground of Hope

Christians ought to reflect on the fact that the Christian hope is not for Christians alone. The redemption in Jesus Christ is a cosmic one, and it is sheer pettiness on our part if we deny its fruit to people of other faiths.

Of course, history does not provide a great basis for hope. It is the Christian hope which enables Teilhard to see hope in the direction of evolution. It is the Jewish Old Testament hope that enables a Marxist like Ernst Bloch to live by the Principles of Hope,[6] which is a fundamental messianic principle. But history itself validates Bloch's own marvellous summary of his philosophy, as Harvey Cox narrates it to us - "S is not yet P." At least the "not-yetness" of Man is something of which most men are directly convinced, even those who are comfortably *bourgeois* and hug that *status quo* in the name of 'law and order." Being is in motion - towards fulfillment or destruction we cannot be sure from history, but history does not succeed completely in laughing at all assumption of directedness in history. Man is a future-seeking being, whether in this world or in another. Possibility, the new, futurity, these are categories within which to conceive the "not-yet being" of man. To use the pompous words of the Second Vatican Council:

"This sacred council proclaims the highest destiny of man and champions the God-like seed which has been sown in him."

Whether history provides us with an adequate ground for this hope, it is the Christian's responsibility to stand behind secular man's hope, for he, like us, is created in the image of God and is destined to be like God. Even if secular man has nothing but the *fact* of his hope as the *basis* of his hope, we must hope with him for the sake of man.

[6] *Das Prinzip Hoffnung, Suhrkamp Verlag,* 1959.

2. Secular Hope and Utopia

Western theology has been bitten by the deep disillusionment of speculative philosophy and secular liberalism. It has seen the depths of evil in man in the pogroms and the concentration camps of our century. It is naturally wary of an optimistic estimate of the future of man.

Secular utopias are also now becoming transformed. The kind of static utopia that Dostoievsky's underground man cynically sought to overthrow, no longer exists in the minds of perceptive secular thinkers. "A revolution in human relations and a turn - about in man himself are therefore the goals of socialism, not the build-up of the productive forces," says a modern Marxist from Yugoslavia.[7]

The socialists are now laughing at us Christians for being concerned only with salvation in the next world, and therefore becoming supporters of the *status quo* of oppression and injustice on earth. They say the utopia is a Christian creation. Socialists are now pursuing more modest goals. As professor Pejovic says:

"If the goal of history is understood to be not salvation, but rather a freer and more sensible life on this planet, then philosophy has the task envisaged by Marx, viz. to be sensible (and not calculating) and capable of helping people to live more sensibly and of leading them to freedom."[8]

And even when other Marxists like Professor Maximilien Rubel insist that "utopia and revolution are the two historical co-ordinates of the socialist movement,"[9] they mean that we must will the abolition of an unjust society (revolution) and the creation of a just society - the New City - which itself is not

[7] Professor Danilo Pejovic, 'On the Power and Impotence of Philosophy' in Erich Fromm, Ed. *Socialist Humanism,* Doubleday Anchor, 1966, p.208.

[8] *Op.cit.p.109*

[9] "Reflections on Utopia and Revolution" in *op.cit.* pp.210-219.

static or perfect. That seems to have been the content of the prophetic message - judgement and hope.

3. *What about Faith in God?*

There we have a more radical problem. If we allow men to go on building up secular hopes not grounded in faith in God, are we not betraying God? In fact, does Teilhard himself give room for a purely secular hope which eliminates any need for faith in God?

If Olivier Rabut's, two-point summary of Teilhard's basic understanding of God's purpose as unilinear from the beginning of the universe to its end point in Omega is correct, then it is possible that faith need not be in God, but only in the process of history.

1. Evolution is infallible, it cannot miscarry, it must go through to the end of what it has been set out to do. It is written within its very law that it will end up at a definite point - the point at which mankind is unified in *one* higher person. Everything necessary to achieve this end, is therefore already in existence.
2. The end would not be achieved, did there not already exist a personal centre able to sum up all consciousness within itself, and finally to unify the human super-organism"[10]

These, as we have stated earlier, are Christian affirmations, about the purpose of God in Jesus Christ. Their antecedents are not in Marx and Lenin, but in the doctrine of the recapitulation of all things in Christ as taught by St. Paul, St. Ireneus, and St. Gregory of Nyssa.

If secular man wants to secularize these faith-affirmations and hold them as secular affirmations, as Montuclard suggests, should we deny him this privilege? Perhaps, secularized man's own faith will become more articulate, when he sees Christians

[10] Rabut, *Dialogue with Teilhard de Chardin*, pp. 115-116.

working side by side with him for the emancipation of man and his unification.

We should be prepared to welcome secular man's faith in the historical process as a pre-figuration of his faith in God.

4. *Why God at all?*

That leads to the fourth question: does all this not mean that the belief in God is something dispensable for man, and that Christians themselves would be freer to help man become man if they would free themselves from this juvenile dependence on God? Is not then the gospel of Christian atheism of Altizer and Hamilton, the most sensible of gospels that the Christian can still hold to?

Not necessarily. First of all, let us make it clear that God is not scared by the possibility of men denying him. He gives us every possible opportunity to do so, because he respects man's freedom. And when we proclaim that "God is dead," God says to us: "That is alright; so long as you do not say, "man is dead." For ultimately, in affirming man, the image of God, we are affirming its proto-type.

God is not jealous about man's achieving the kingdom by his own efforts. After all, all the good efforts of man are nothing but the efforts of God, for it is God who acts in us. God has become man. Let man act for the good of his fellowman, and that will be the God-man acting.

As for conscious faith in God, we who do believe in God, even if it is unfashionable, need the chastening fire of a fighting atheism both within and without the Church to bring purity and clarity to our faith.

God dwells in light unapproachable. He dwells also in the very being of man. And when man grows into goodness, the face of God appears on the faces of men, both individually and corporately.

Let us not be too keen to defend God. Our defense only makes him look weak and ridiculous. Give yourself to man- and slowly you will discover that you do believe in God.

By making God *necessary*, we do no service to God.

5. *Why no mention of Sin and Evil?*

Yes, evil is there, for all of us to see. It does not go away even when our eyes are shut.

Teilhard is not unaware of the problems of evil. Neither was Augustine or Gregory. History is a realm where the wheat and the tares grow together. There is always the possibility that evolution may miscarry, that non-being may triumph over being. If that possibility were not real, faith would have had no meaning. Evil is there, almost pregnant in the *status quo*. But it is the negation of being, not being itself. If we sanctify the *status quo*, we are sanctifying evil and making it absolute.

Hope is, as Tillich put it, the negation of the negative. What is, is not the real. The real is, what is to be. In denying what is to be (the future) and affirming what is (evil), we are denying the real. This is not realism.

Teilhard has a pregnant passage on this subject, which leaves open the possibility of universalism itself being wrong and points to the inevitability of catastrophe:

> "There are no summits without abysses. Enormous powers will be liberated in mankind by the inner play of its cohesion: though it may be that this energy will still be employed discordantly tomorrow, as today and in the past. Are we to foresee a mechanizing synergy under brute force, or a synergy of sympathy? Are we to foresee man seeking to fulfil himself collectively upon himself, or personally on a greater than himself? Refusal or acceptance of Omega? A conflict may supervene. In that case the noosphere, in the course of and by virtue of the processes which draws it together, will, when it has reached its point of unification, split into two zones each attracted to an opposite pole of adoration. Thought has never completely united upon itself here below. Universal love would only vivify and detach finally a fraction of the noosphere so as to consummate it - the part which decided to 'cross the threshold', to get outside itself into the other."[11]

Conclusion

Tomorrow, the world may come to an end, not with a bang, but in a whimper, perhaps. But then, tomorrow may go on, for no man knoweth the time of His coming.

In either case, the kingdom is here, we have no choice but to live it, whether here or hereafter.

God is here too, in man. Man is unbounded, except as creature, in his hands are power, wisdom and love. He has the capacity to create and to give, and in giving himself to his fellow-man finds fulfillment and growth.

The horizon of man is always receding. But that is no reason for not moving.

The creator is up to something in the creation. The creation is in motion. It is not that He comes into history now and then to act. He has set that history in motion, and given us the intelligence to discern and direct the movement of that history.

Humanization as a world-problem is that of drawing all men all over the world to shed their pettiness and their lethargy, to put away their narrow loyalties and anxious fears for themselves, and to join in the one single movement of history towards point Omega.

Along the way, death will come. The movement will go on, on both sides of the veil.

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[11] *The Phenomenon of Man*, Collins, 1960, pp. 288-289.

CHAPTER 4

Science, Technology and the Future of Humanity

Some Questions for Reflection

1. Modern science, and the technology based on it, are comparatively new in the history of humanity - only a few centuries old. Science had once to fight for survival against the unjust onslaughts of the dogmatic western religion. That period is now happily over. Science has now come of age, and can stand on its own, not seeking any protection or promotion from religious circles.

2. On the other hand, science itself had been tempted, especially in the light of some of its more spectacular achievements at the end of the 19th century, to claim certain dogmatic certainties for itself. But as our century draws to its close, dogmatic scientism becomes increasingly out-dated and unfashionable.

3. Today, one notes at least four different attitudes to science and technology occupying centre stage.

   a. First, comes the popular view about science and technology, a view which is a kind of hang-over from the hectic days of triumphalistic scientism. This is the belief, widely held, that science and technology are potentially

capable of solving all the problems of mankind. This naive view is especially common in the developing countries of the world, where the wide use of modern science and technology is comparatively new, and the marvels of science and technology can still make a great impression on the minds of ordinary people. I think this view is still rather common in India.

b. On the opposite extreme, and almost totally irrational, is the view of the counter-culture syndrome in advanced industrial societies. Theodore, Roszak, for example, (Where The Wasteland Ends, The Making of a Counter Culture) says: "Because science dominates the reality game of high industrial society, I am convinced that a hard critique of its psychology now has everything to do with restoring our cultural health" (Wasteland, p.371). Acknowledging his debt to such contemporary thinkers as Abraham Maslow (solution proposed: 'hierarchical integration' of many modes of knowing, including those of Tao and Zen as well as the scientific), Lewis Mumford (a science based in "an organic world - pictured"), Lancelot Law Whyte (integration of art, ethics and natural philosophy within a 'science of form'), Thomas Blackburn (integrate sense - experience, intuition and objectivity on a complementary model), Arther Koestler (anti-reductionist emphasis on wholes and systems), and others, Roszak charges that "science is far too narrowly grounded in the personality. It closes out too much experience and in this way drastically distorts what it studies" (Wasteland, p.372).

His view is that "Science has been lionized out of all proportion by the necessities of urban-industrial life and by the political opportunism of the technocracy." Roszak's solution is the "rhapsodic intellect", in which science is wedded to mysticism and art to produce a revolution of consciousness, which restores the "sacramental vision of nature" to science. But this revolution "will happen, perversely and heretically at

the fringes of our culture and work its way in toward the center. The scientists, and guardians of single vision in urban-industrial society and the intellectual linch-pin of the technocracy, may be among the last to hear the news" (*Ibid.*, p.378).

c. A third type of view comes from English-speaking philosophers of science. Despite the wide divergence among them, there is growing consensus among Karl Popper and Thomas Kuhn, Paul Feyerabend and Stephen Toulmin. While Popper argues for the autonomy of a "third world" of man-made ideas called scientific knowledge constantly in process of revision and evolution (*Objective knowledge: An Evolutionary Approach*, OUP.1972), Feyerabend argues for epistemological anarchism in science (*Against Method*, New Left Books, 1974). The second edition of Thomas Kuhn's *Structure of Scientific Revolutions* (with an added postscript) came out in 1970 (Chicago University Press) with his theory of paradigms further refined. Kuhn sees science as a 'way of seeing' through paradigms or picture-analogies, the paradigms themselves being in a process of constant revision and change, change not in accordance with any rational law, but almost haphazardly, often created by congeries of specialists' communities" (see Imre Lakatos and Alan Musgrave, Ed., *Criticism and the Growth of Knowledge*. p.253).

Science is a system of theory choices, preference being for theories or paradigms with greater accuracy, scope, simplicity and fruitfulness. But these are not the only criteria for theory choice, which also seems to demand some free creativity, i.e., an irrational element as well.

All these philosophers, however, agree on one point - Science is not proven knowledge; it is one way of seeing reality, quite a successful way, admittedly. But no thinking person would claim infallibility for science, nor would he give it any methodological monopoly over human knowledge. Science is

a useful tool, it helps them. It may also help us partially to understand the nature of reality, but cannot give us an adequate picture of it. Such a modest evaluation of science seems to be the one prevalent among most philosophers of science.

d. A fourth view of science is the one held in most socialist countries. It is difficult at the moment to document this view from primary sources, since western language sources are scanty. One of the best recent western studies is Loren R. Graham's Science and Philosophy in the Soviet Union (Vintage Books, New York, 2nd ed. 1971, 584 pp). What we see here is a science-based natural philosophy. Marxist ideology itself claims to be the science of dialectical materialism, a scientific analysis of social reality. Graham calls "contemporary soviet dialectical materialism" ..... "an impressive intellectual achievement" (p.430). His praise, - and let me add that the American Professor Graham is no Marxist or Marxist sympathizer, - is rather fulsome:

"In terms of universality and degree of development, the dialectical materialist explanation of nature has no competitors among modern systems of thought. Indeed, one would have to jump centuries, to the Aristotelian scheme of a natural order or to Cartesian mechanical philosophy, to find a system based on nature that could rival dialectical materialism in the refinement of its development and the wholeness of its fabric" (*op.cit.*, p.430).

In other words, the Marxist effort to integrate philosophy with science has no contemporary parallel in the west, where the two are kept in fairly watertight compartments even by many philosophers of science. One may question some of the assumptions of soviet dialectical materialism but its rigorous effort to build an integral system that unites ideology, philosophy and science in a more impressive way than any other. But this also means that eastern European scientists and philosophers of science do not share the uncertainty about science and technology, so characteristic of the contemporary

western scientific thinkers. The west feels tempted to call the soviet attitude 'Scientism' - the belief in the omni-competence of science. The eastern European would deny that the epithet is merited. He would say that Marxism is the only ideology that integrates science in a larger framework that deals with all aspects of reality. It is a flexible ideology, which can give up a strict laplacean type of determinism in the light of the insights of modern physics, but sticks on to causality despite indeterminacy at certain levels.

It is not a mere platitude to say that all these four views must contain some element of truth, though the degree of verity in each may be different. The third view which is the view of most thinking scientists outside the socialist world today, could be considered more modest and objective than the first or the second; but it does not raise the question of the role of science in the sum - total of human endeavour. It is that question that increasingly rises before us, as western civilization itself goes through a measure of soul-searching and self-criticism.

The main point of this paper is to sharpen the articulation of this question and some related ones. Some of these questions are:

1. What degree of regularity and determinacy has to be assumed in reality in order to explain the fact that science has been 'successful'?

2. Does science provide objective knowledge of reality? Does the fact that at certain microlevels the observer is inescapably influencing the structure of the reality observed, lead to the conclusion that in all scientific knowledge pure objectivity is unattainable? What kind of objectivity does science provide? To what extent is the claim to objectivity questionable?

3. It has often been assumed that science and technology are by their very nature universal, while culture is by nature local. Can this view be sustained? How is modern science and science - based technology related to western culture, and at what points do we need to beware of this relation in adapting modern science and technology to our needs in India? (This question is much wider than the issue of small, medium or appropriate technology).

4. On the one hand, it is charged that the classical *Vedanta* tradition which denies any ultimate significance to historical and material reality is inimical to the development of modern science and technology in India. On the other hand, it is being argued that the view of reality disclosed in modern physics is much closer to the world-view of Taoism, Buddhism and Hinduism than to West Asian religions like Judaism, Christianity and Islam (see. Fritjof Capra, *The Tao of Physics*).

   What is the truth in either of these assertions?

5. Science can promote certain values like integrity, honesty, clarity etc. But most of the value questions facing society lie outside the purview of science as such. Some questions in scientific investigation are themselves not capable of scientific solutions. (e.g. What degree of risk are we justified in taking in connection with experiments involving genetic mutation, and creation of new bacterial strains?) How does society make sure that the work of the scientist is itself subject to values and norms decided upon by society?

6. Development of the scientific consciousness has been alleged to be detrimental to the development of the faculties like intuitiveness, aesthetic sensitivity, vision of the whole of reality, etc. Is there any truth in this allegation? Have we over-valued science and technology because of their phenomenal success in the recent past? How do we correct this imbalance, and devote greater attention to the development of the other faculties of the human person?

7. Science tells us very little about the quality of life. And it is being increasingly realized that a higher quality of life

should be a permanent orientation in all economic and social planning. Can science play any role in quantifying or 'functionalizing' quality of life in such a way that it can be programmed into national planning? What indicators or parameters of quality of life are available for this purpose?

8. Research in science and technology usually finds funds mainly from two sources - defence establishments and large corporations. The interest of the former is in military technology and that of the latter in fairly quick profit. How can a society ensure that research funds are available for scientific projects that genuinely promote human quality of life, apart from defence utility or commercial profit?

9. Is it not a luxury for us, in a country like India, where 60% of our people still do not have a dignified human standard of living, to worry about the long-term cultural and spiritual consequences of adopting modern science and technology, since we have no other instrument available for removing that poverty? On the other hand, once you have taken the option to follow the road of science and technology and urban-industrial civilization, can you really change direction in mid-course? Have we, in India, any other option than to follow this road and face the consequences when we get to the stage where the problems generated by the road nearly tend to over-whelm our humanity?

10. In terms of political options and their ideological underpinnings, do we really have an alternative, a third way, a way which is different from, and avoids the pitfalls of, market economy 'capitalism' of some sort and centrally planned marxist type of socialism? Is it simply the formula of non-alignment plus mixed economy? Is there an ideological road that is politically viable which takes seriously our own cultural heritage and makes the best use of science and technology? Or, are we condemned to the

fate of formulating our positions only in relation to certain western positions, i.e. opposition to some, partial acceptance of some, odd mixtures of different western positions (mixed economy), qualifications of some of them (socialistic pattern of society), substitutes for western concepts, often mostly in name (Sarvodaya, Janasakti)? Where is the forum where our scientific cultural minds and our spiritual leadership come together for a common creativity? Is our planning commission or our education ministry the right place to lodge this concern? If not, do we need a new one, high-powered with creative strength, flexibility, time and resources?

CHAPTER 5

Emerging Consciousness for a New Humankind

If history is a documented memory, then the history of the human consciousness is very short indeed. Fortunately, memory is more than history, and the human consciousness has a longer memory than its documented history.

My desire in this paper is to trace the outlines of the development of human consciousness, in order that we may gain some understanding of where it is going in the near future. And in order to trace that development, I have often to step outside the limits of our documented history. Academic scholarship, which itself is part of that developed consciousness and whose competence to judge such matters needs often to be questioned, should bear with me, if all I say cannot be documented.

The human consciousness has a beginning which remains elusive to our methods of investigation. Where was the first human consciousness? Was it only in one place, or did it emerge in a dozen different areas. And if the first human (African) couples had parents, as they no doubt must have had, who were these parents, and how and in what way were the children different from their parents? How could the children be human and the parents animal or sub-human?

This problem of the difficulty of tracing the line of demarcation (between human and animal) will occur elsewhere, for example between vegetable and animal, or between inorganic and organic. From the very beginning, we should be prepared to examine the thesis that consciousness has no boundaries and is perhaps a single unit with many modes. That thesis, as old as consciousness in humanity, we shall not examine in detail in this paper.

So it seems that the emergence of human consciousness, as distinct from animal consciousness, is historically and even conceptually untraceable. And the infancy of that human consciousness also remains untraceable. Scientists tell us today, that humanity of our kind has been around on our planet for more than 600,000 years, but that is a rough estimate, a good guess based on available evidence, one that may have to be substantially revised later on, in the light of new evidence.

Is it not surprising that most of the history of the human race is pre-historic in the sense, that the fully documented history hardly goes back 6000 years not even 1% of humanity's existence on earth? What is the significance of the fact that the human consciousness cannot document 99% of its historical development? For me one thing is clear. We know so little, without conscious minds, of the true nature of our consciousness. What Biology, Psychology and other modern disciplines can tell us about human mind and its evolution cannot even give us a clue to its real nature. For that clue we may have to trust the deeper reaches of our consciousness.

1. Consciousness in History

As consciousness emerges into remembered and documented history about 6000 years ago, it is a universal phenomenon with many common characteristics, but also with local peculiarities - reflected in differences of language, culture, myth and ritual. But the common characteristics of this universal human consciousness as it emerges into historical view are

striking. From Father Smith to Mircea Eleade, there have been many attempts to trace the main elements of this "Primal Vision" through the study of 'primitive cultures'. Our kind of rationality is certainly not one of these characteristics. Neither is the modern confidence that an individual mind can grasp reality through rational thinking.

What was there was an unverbalized awareness that one's mind and body were part of a whole which included not only other living human persons, but also earth and sun, river and mountain, plants and animals, the tribal ancestors and many "mythical" beings. One lived this unity with the whole through dance and song, myth and ritual, rather than talk or write about it. Talking and writing may be important for us children of the European enlightenment, with our pronounced individualism and exaggerated confidence about language and proposition. But, we will never experience that fundamental unity through talking and writing. It has to be experienced, sensed, lived, even today for us children of the European enlightenment.

The second aspect of this primal vision, was the awareness that there was more than what met the eye and the ear. This little corner of the universe where we run about and play is only a little corner, which by no means openly reveals the nature of the whole. That nature has to be sought first through our sense-perception, through language and myth, worship and ritual, then beyond these through a disciplined search, to a realisation, which cannot be expressed in words.

The primal vision was universal and is still universal. It is not only in the "primitive" tribes that it survives. It lives today in the suppressed layers of the consciousness of us children of the European enlightenment. And my strong thesis today is that we must re-activate this layer of our consciousness, if we need to recover wholeness and healing. Both aspects of the primal vision are important - the unverbalized, ritually experienced awareness of wholeness, and the disciplined search for the hidden meaning of the whole.

2. The Emergence of Verbalized Consciousness

This second stage (always speaking of the later 1% of time of conscious human existence) was also universal. Language became rich and diversified but was always supplemented by ritual, music and dance to express the deeper dimensions of human experienced perception. With language, the self emerges as subject distinguished from object. The self as it emerges in prehistory is not totally alienated from the social, biological and inorganic environment. In fact, on the contrary the higher quest in all East Asian religions is to experience and realise the unity and oneness of the personal self with the cosmic self. This is the witness of two of the oldest spiritual traditions - the Indian and the Chinese.

And culture arises in this context of relating the personal to the social self and to the cosmic self. At this stage, the "world is not an object for the subjective self to "explore" and "manipulate." The world like the body, is where you are the matrix and manifestation of the self. It is only after the European enlightenment that people begin to think systematically of the person as subject and the world as object.

The development of language brings about new possibilities of cultural development. Language as it develops is largely spoken, very little written. Alas, this leaves us today in the dark, or at least very much in the dark, about what our pre-historic ancestry thought and said. Spoken language was one new symbolic expression of man's emerging consciousness. Written language is only a symbolic expression of what is itself a symbolic expression, namely spoken language.

As language developed, often along with greater elaboration is cult and ritual, the human consciousness rose to a new level. But this level was not without distortions. As verbal enrichment and conceptual clarity emerged, the possibilities of false perception also increased. The new perceptions were themselves the result of the added facility of clear conceptual language. There was more prose than poetry. Words in the

previous language were evocative rather than descriptive, activity in the right hemisphere of the brain decreased often, as the left hemisphere developed; philosophy, mathematics and the rudiments of science developed, but also language which directed ritual and morality with greater precision and clarity. The *Sutra* for meditation gives place to the *sloka* for disquisition, description and prescription. As greater manipulation of the external world became possible through language (descriptive and prescriptive) the inner world becomes turbulent with impingements from that external world. Where there was experience of inner harmony with the external world from which humanity was emerging, now there was the new struggle that of adaptation to the external world, and the effort to manipulate that world to suit one's needs. As agriculture and rudimentary technology developed and became more sophisticated, the new environmental transactions began demanding new adjustments in the body and in the brain functions. Evolution became more rapid not bodily adaptation so much as mental development. The drastic acceleration in evolution takes place in the form of culture, which included not only ritual and morality, but also new methods of cultivation, hunting and housing - leading to what we call civilisation, with the accent on the *civitas* or urban development.

But this civilisation was far from 'secular' in our sense of the term. It was deeply pervaded by 'religious' perceptions mythically or ritually expressed. The dealing with the immediate environment through gathering knowledge about it, and manipulating it in accordance with that knowledge are material processes, but always within a matrix of spiritual and religious presuppositions about oneself, other selves, the external world and the God or gods involved in every natural phenomenon and process. Language, written or spoken, becomes the major instrument of consciousness, but by no means its only instrument. Myth and ritual always, enrich and even shape language.

3. Intrinsic Evolution and Extrinsic Evolution

In order to understand the nature of the problems facing the human consciousness today and the possibilities before it, we need to study the dialectic between intrinsic evolution and extrinsic evolution in the human species.

One way of grappling with this problem is to use the conceptual tools developed by Edward T. Hall, the author of *The Silent Language* (1959), *The Hidden Dimension* (1966) and *Beyond Culture* (Doubleday Anchor, 1976). His basic concept is ET: not Extra-Terrestrial, but Extension Transference. Simply put, it goes like this. Human societies create externalisation of processes, e.g. instead of cutting meat with your teeth, you do it with a knife; instead of speaking, you write; instead of walking, you roll in a two-wheeled or four-wheeled carriage with or without a mechanical motor.

As these externalisations of internal body/mental processes develop they can be separated from humanity and reified or "thingified." Among the examples cited, the knife, the pen and the motor car are things which can be made by others and bought by me. They take to the market, along with the products of agriculture. All things including food, drink, clothing and artefacts became commodities. Air and water alone are largely exempted because they are in abundant and uncontrolled supply.

One of the greatest crises in the development of consciousness has come about in the period of "universal affluence" and "consumption explosion." As affluence comes within reach, and the commodities become available without visible limit, there is a tremendous pull on consciousness towards the means and manifestations of affluence, reified and external to consciousness.

This pull becomes universal, and children brought up within such a culture are unable to resist it. As consciousness becomes forcibly attached to commodities and things the other capacity of consciousness, to be at one with itself is turbulently ruffled.

The mind is thus a battleground - the extrinsic evolution affecting the intrinsic evolution of consciousness. As knowledge develops through extrinsic evolution of consciousness in its capacity to know things - to know how they work (science) and to know how to work on them (technology), there is a concomitant development of intrinsic ignorance. Extrinsic evolution is by "separative" knowledge, while there is a corresponding devolution in the instinsic aspect of consciousness and its capacity for "integrative" knowledge of the whole and the self. As the objective and physical order becomes better known and so more "real" the inner realm and spiritual realities became less perceptible, less held in awareness. Growth in "knowledge" of the external world thus becomes correlated to an increase in "ignorance" of the world of the whole and the self.

Sri Aurobindo analyses this ignorance in terms of a sevenfold self-ignorance:

a. **Original Ignorance** - Ignorant of the Absolute, the one from whom the many of our knowledge originates.

b. **Cosmic Ignorance** - Of the oblivion timeless and immutable self in the midst of our knowledge of the many selves which are in time and change and which we take to be the only truth.

c. **Egoistic Ignorance** - Ignorant of our self which is in union with the cosmic self knowing of the ego, the Id and the super ego, we presume that the "I" is the most important centre of existence.

d. **Temporal Ignorance:** So aware of our little span of time and change, we become ignorant of our own eternal being in time.

e. **Psychological Ignorance**: Taking the little layer of our conscious mind to be the whole of our minds, we become ignorant of what Aurobindo calls the super-conscient dimensions of our psyche.

f. **Constitutional Ignorance** - Thinking that we are constituted by life and body and mind we become ignorant of the supreme and mysterious constructive principle in us.

g. **Practical Ignorance** - Caught in a mass of sensations, thoughts, actions, willings, responses and so on, wandering among errors and desires, strivings and failures, we become more and more practically ignorant about what life is for. (*The Life Divine* Book II, Part II, Chapter XV).

This is a summary of Sri Aurobindo's perception of *Avidya*, of ignorance of the human problem in general. It is against this multiple ignorance that the sage of Pondicherry would prescribe 'integral Yoga' as the medicine. An integral yoga includes as a vital and indispensable element in its total and ultimate aim, the conversion of the whole being into a higher spiritual consciousness and a larger divine existence. (*The Synthesis of Yoga* p.265).

Aurobindo suggests that not all may be able to plunge headlong into this "larger divine existence," and may be better advised to master the *Karmayoga* first. But the ultimate aim is to reach the "supra-mental consciousness" where the dominant reality is integration of will, emotion and consciousness, in "union with the divine reality of our being and all being" (p. 266).

4. The Nature of the New Consciousness

The main point of this paper emerges at this point. It is Sri Aurobindo's point that overcoming the multifold ignorance through integral yoga is the solution to the human problem. While agreeing with this solution as a partial answer, from my Christian perspective I need to go further in two dimensions beyond this solution.

Aurobindo admits that supra-mental consciousness, experiencing the unity of one's own being and of all being with the divine is a "difficult, distant, ultimate stage, the end of a

far off vista" not an immediate objective, but one that comes after jumping over many obstacles.

It is at the point of this ultimate objective that I wish to express my qualms. I submit that there are two qualifications to Sri Aurobindo's programme which are implied in it, but not adequately worked out. These two aspects are (a) community and (b) the material world.

Both are implied in Sri Aurobindo's perception that the ultimate aim is the realisation of the unity of one's own being and of all beings with the divine. My contention is that, even this side of attaining the supra-mental consciousness this unity must be worked out in a different way as a guide to social living in a world of science and technology, and further, that such a working out of community life and scientific technological mastery will alter the content of the experience of the supramental.

There is no doubt, that Sri Aurobindo and Sri Ramana had an experience of the over-mind. My submission, presumptuous as it may seem, is that we need a different quality of self-realisation through community living and scientific - technological mastery of the external world. And both in projecting the ultimate objective and in clearing the path to it. Community living and mastery of the external world through science and technology have an essential role.

Sri Aurobindo is unlikely to agree with me at this point. For him, science - technology and perhaps even community life, belong to the world of multi-fold ignorance, to the inferior mind and not to ultimate reality. I suspect that, again speaking very presumptuously, that is what has gone wrong in Pondicherry, both at the Pondicherry Ashram and at Auroville, as well as at the ashram in Delhi. I am not suggesting that a harmonious community, knowing and producing through science and technology is the ultimate goal of humanity. But, I am suggesting that the very quest must begin not from the

ego's need for emancipation and realisation but from the perception, that our unity in being with other human persons and with the material world has to find expression in an integral community yoga, which aims at the emancipation of the whole of reality and not just of one's own ego.

According to Sri Aurobindo, the pursuit is one of knowledge "a state of knowledge by which we can touch, enter or know by identity this eternal, infinite and absolute, a consciousness other than our ordinary consciousness of ideas and forms and things, a knowledge that is not what we call knowledge but something self-existent, everlasting, infinite (*op cit.*, p.273). My contention is that the shaping of our ordinary consciousness has something to do with the content of the other consciousness into which we have to enter.

This is a major point of disagreement, and I do not want in the name of agreement between Christians and Hindus to blur this difference of perception which is crucial.

The *Advaita Vedantin* often takes the dogmatic position that change, which is related to time has nothing to do with truth, which is unchanging and eternal. As a Christian I do not agree with this view. I more or less summarily reject the following view of Sri Aurobindo.

"All cosmic existence or all that we call existence is a state of ignorance. All that is individual, all that is cosmic has to be austerely renounced by the seeker of the absolute truth. The supreme quiescent self or else the absolute *Nihil* is the sole truth, the only object of spiritual knowledge. The state of knowledge, the consciousness other than this temporal that we must attain is Nirvana, an extinction of ego, a cessation of all mental, vital and physical activities, of all activities whatsoever, a supreme illumined quiescence, the pure bliss of an impersonal tranquility, self-absorbed and ineffable" (*op.cit.*, pp.273, 274).

Without settling this question of the nature of truth, we cannot begin to work towards delineating the cartows of the

"emerging consciousness for a new humankind". At this point, I must go into a certain amount of tedious Christian theologising, in order to give some content to the expression of my own belief as a Christian.

5. The Nature of Truth and of Reality

Truth and reality are difficult terms to expound or clarify. Etymologically, the English world Truth is *troth*, that which is reliable and trustworthy. In the Christian tradition, the Hebrew expressions *emeth* and *emunah*, both of which are translated 'truth' have the connotation of steadfastness and reliability. Steadfastness is different from unchangingness. For the Hebrew the unchanging is static, but steadfastness is dynamic, active, and compassionate, not impersonal. In fact, in many instances truth is compounded with mercy and love and justice. Just to cite a few examples:

Deuteronomy	32:4	'a God of Truth (*emunah*), no evil, merciful and upright.
Genesis	24:27	"Blessed be Yahweh, the God of my master Abraham, who never forsakes his steadfast love (*hased*) and truth (*emeth*).
Samuel	2 : 6	"And may Yahweh do steadfast love (*hased*) and truth (*emeth*) with you
Psalm	25:10	"All the ways of Yahweh are unfailing (*hased*) and truth (*emeth*) to those who keep covenant with Him and his testimonies.
Psalm	98:3	"He (*Yahweh*) has remembered his unfailing love (*hased*) and his truth (*emunah*) to the house of Israel."

These are not accidental coincidences. They form a pattern in the Old Testament. The words *emeth*, *emunah* and *hased* have

stood for truth, faithfulness, mercy, love and unfailing dependability. And this is the basic Christian understanding of truth not as "unsublated by subsequent experience" but as reliability and dependability in love, compassion and uprightness. This is not an impersonal understanding of truth. The idea of changelessness is there not in a static sense, but in the sense of an ever recurring, surprising fidelity and reliability.

It is my philosophical contention that is the only kind of truth one can attain while we are in the body and possibly also without the body. Even when one experiences the unity of one's being with the being of all selves and of the world, this is not a knowledge which has no further to go. I know that Vedantins believe that the *Sakshatkara* is the terminus beyond which there is neither road nor need to proceed. I cannot accept that belief, and I do hope that Sri Ramana and Sri Aurobindo are still proceeding along the new paths.

As a Christian, I want to experience my oneness with God and with His universe, but I believe that when I do experience that oneness I would only have started on a quest which goes on indefinitely, with ever new surprises and new stages of realisation and growth into perfection. But I believe also that, once I proceed on the quest after having realised my oneness with the all, I would be doubly concerned to carry the rest of humanity and its alienated consciousness with me. I would want all humanity to experience this oneness and to desist from the follies that arise from the separated consciousness.

The important point is that, I do not experience truth as unchanging or static. Truth is power: dynamic power, compassionate, wise, creative power, power in love and freedom. Truth is not the stopping point, but the starting point of true existence. "You shall know the truth and the truth shall make you free" - free to live and not just be.

Truth is love, for God is love. Love is the all binding element of consciousness and truth is experienced when my unity with all is experienced as love and not as a concept.

It is the truth-love combination that we have to experience in our consciousness which requires this integration of truth with love, reality with compassion, of fidelity with goodness, reliability with righteousness.

6. The Emergence of the New Consciousness

If *emeth* and *hased*, reliable truth and unfailing love are thus integral to each other, and if our unity with all beings is merely a given, but also a task to be worked out through love the spirituality for this new consciousness must break new ground, going beyond the integral yoga of Sri Aurobindo and beyond the simplistic *advaita* of many of its modern exponents.

Integrated yoga still demands a shedding of all interest in the passing world revealed to our seven fold ignorance. The new yoga asks that we turn to this world with a new love, a new redeeming compassion towards it, and a passionate interest in it not to make it serve my ends, but to make it serve its own best interests.

I have no name for this new yoga. To call it integral yoga would be to invite mis-understanding. It is a community yoga which takes the *vyavaharika loka* seriously, seeking to make it a manifestation of love, beauty and goodness.

It is at this point, that we have to transcend all naive simplicisms. A herically new spirituality is called for - a spirituality in which people of all faiths, and the secular devotees of science / technology can all find a role to play, a participating role which completes and enriches the whole.

It goes beyond integral yoga in the sense that while it acknowledges the evanescent and transitory character of this world, which is still taken seriously, though we do not take it to be true. But just as one cannot live without food and air and water, human beings cannot realize the truth without going through this world of historical reality.

It takes this world sufficiently and seriously to be pre-

occupied with it as the arena where truth has to be made manifest loving compassionate, life-giving, dependable truth. It takes a community not only to be seriously and totally concerned about one's own personal *sakshatkara* or *nirvana* but to be passionately committed to the community's common quest for manifesting the compassionate, loving, dependable truth of God in the midst of all the struggle and strife, selfishness and discord. It can be called 'integral community yoga' because it wants to integrate inner and outer reality in a holistic approach, but because it seeks fulfilment of a community rather than that of individuals, and because it is a discipline which demands the best in us.

7. Conclusion. 'The Basis of Integral Community Yoga'

I submit that the basis of this Integral Community Yoga would be three-fold:

a. The community's worship experience and awareness of the unseen dimensions of reality-enacted in dance and song, ritual and sacrifice, silence and reflection, meditation and contemplation. This is the formative experience of the new consciousness being formed-like the thousand petals of the lotus turning toward the sun and receiving energy to grow together into a thing of beauty.

b. The community's life together, life and relations with each other in the community and with those outside the community, a life of simplicity and joy, love and compassion peace and tranquillity, of caring actively for the needs of others, of resolving conflicts, of overcoming bitterness and meanness, jealousy and ambition, resentments and grudge a community that radiates blessing, and is actively concerned for the whole of humanity without any narrow boundaries.

c. The community's capacity to handle material reality through science and technology, art and music, in order to create new things of beauty and usefulness, with which to

praise God, to bring out the glory of the universe and to serve all life and all truth.

The new consciousness wave that is in the West abroad has many possibilities, but many dangers are also inherent in that wave. The fascination of the spiritual world can be a trap, and without proper guidance people can slip into greater unfreedoms. I would like to suggest some rules of thumb for guidance:

a. something is not necessarily true because someone from the spirit - world communicates it to you through extraordinary revelations.

b. the teachings of a person is not necessarily true or safe, just because that person can perform extraordinary miracles.

c. the quality of a guru or a religious community has to be assessed always through the truth, wisdom, love and goodness, manifest in his or its life. Compassion for all, love without hatred or narrowness, non-desire for material gain or worldly popularity and honesty without any ostentation or false piety.

d. Beware of any religious teacher who panders to your love of ease, to your inclination to lust, or to your desire to be a worldly success.

CHAPTER 6

The Ecological Crisis and the Quality of Life

A Patristic Questioning of our Triumphant Anthropology

The question about the "quality of life" i.e. of the human qualities that are really worthwhile to promote, has been coming up to the surface of human consciousness from several directions at once.

The ecological or environmental crisis is perhaps the best known occasion for such awareness. But people, generally think the ecological crisis only or mainly in terms of the pollution of air and water or the conservation of the forest; the range of ecology is far wider, and the solution to the problems raised goes beyond the scope of technology. Ecology means a scientific understanding of what human beings do to their environment in the process of inhabiting the earth and making a livelihood out of it. Man needs, not merely air and water to live but he needs energy from the earth, both in the form of food for his body and food for his productive work - all the way from cooking his food to sending rockets to the moon or Mars. In the good old days a man consumed, I am told, only as much energy per hour on average as a 100-watt bulb did. Today,

each human being inhabiting certain parts of our earth consumes about 30 pounds of steel a day, in addition to large quantities of copper, zinc, aluminium, lead, and petroleum. His energy needs have grown, in industrial societies, from 100 watts an hour to 10,000 watts an hour. That is almost a 1,000 percent increase. Scientists suspect that the energy supply in the world is limited, and that we cannot go on making unrestrained demands on the poor planet earth.

But the ecological problem is not simply a question of the quantity of energy consumed, there is the further question of the sheer inequality of energy consumption. A U.S. Senate report admits that the total amount of energy consumed by Americans alone in the ten years from 1959-1968, exceeded the total amount of energy sources consumed by the whole of humanity in the whole of its history before 1959. If the American rate of consumption of resources were to be adopted by the whole of the world's population today, in six years the total known petroleum resources of the world would be exhausted, and in less than a year all the iron, copper, sulphur, and timber resources would be exhausted. Can we go on increasing the per capita consumption of resources everywhere in the world without wondering where all this consumption of resources is going to land us in the fairly near future? "Spaceship earth" is not a farfetched concept. We are on a planet travelling through space, with only a limited quantity of resources in it. Unless we use some calculated restraint in consumption and production, and not only in population growth, we are simply doomed to planetary suicide. No wonder people are talking seriously not only about zero population growth, but also about zero economic growth.

The public is only just beginning to hear about the Club of Rome report. The Club of Rome is an exclusive club of the industrial economic establishment of the capitalist world, membership being limited to distinguished bankers, industrialists and scientists specially invited. Now about 25

countries are represented in the membership club. The report was prepared by a team of 17 scientists from various fields and published in January 1972 under the title The Limits to Growth (197 pp). *Time* magazine had a review of it in its January 24th issue, and an essay based on it in the issue of August 14th, 1972.

The conclusions of the report have been radically questioned by critics, on the ground that the methodology used by the computer is faulty. The main conclusion is that if population grows at the rate of 2% per year and industrial production at 7% annually, as they are now doing, sometime during the life-span of children born today, the world would run out of essential natural resources like coal, oil and metals. The critics counter by arguing that technology can find new resources, and new techniques of recycling resources in order to reuse the so-called waste materials. Sea water, for example, is a practically limitless resource and techniques have already been developed, though still commercially unprofitable to extract hydrogen from sea water by electrolysis or thermal decomposition. New techniques are on the way to being perfected for extraction and liquefaction of hydrogen for use as fuel, though these techniques involve the use of nuclear reaction, a proliferation of which may have their own disastrous consequences. But the fact, that it was liquid hydrogen that fuelled our moon rockets has its own significance for the future.

Quite apart, however, from the risk of exhausting the resources of spaceship earth, the cry to halt uncontrolled economic growth has its specific rationale in terms of the finitude of the creation. The O.E.C.D. has recently brought out a publication entitled *Science, Growth and Society* which says in measured tones:

"Many aspects of developed society are approaching a condition that may be described as the precursor of saturation, in the sense that things cannot go on growing much longer on

some lines without reaching fairly fundamental limits. Indications of saturation are present in total population, pollution of environment, size of urban conglomeration, in traffic, even in higher education..... The general public will be slow to accept the full implication of the goal of harmony of man and his environment, it does not yet recognize the costs, both in economic terms and in terms of limitations on freedom of individual choice - and it will be only slowly educated to understand and accept them."

If the question could simply be limited to ZPG and ZEG - zero population growth and zero economic growth, things would not have been so complicated. There is the problem of the two-thirds of the world, which still needs to attain much faster levels of economic growth to achieve even a subsistence economy. If for the rest of the world, to achieve the present level of the industrially developed countries would spell disaster for the whole world not only in terms of resources exhaustion, but also of air and water pollution, unmanageable urban agglomeration, and impermissible limitations on personal freedom, then it is clear that the developed countries, including Germany, are already economically and industrially over developed, and the need is not just to achieve ZPG and ZEG, but to de-develop!

The issue came up quite clearly at the United Nations Conference on the Human Environment, held at Stockholm from June 5-16, 1972. But it was not resolved there. The concern for ecology dominated the over developed countries. The concern for international social justice was uppermost in the consciousness of the still developing two-thirds of the world.

For the over-developed countries, according to speeches by people like Barbara Ward (Lady Jackson) and Revie Dubos at Stockholm, the way forward was to invest more resources in non-polluting enterprises like music, arts, sports and education. This was certainly too simplistic a solution, for it is not easy to find the resources to put into these service

occupations and at the same time assume high standards of living to the whole population without increasing industrial production. As McNamara, representing the World Bank, puts it at the Stockholm Conference, "the achievement of a level of life, in accordance with fundamental human dignity for the world's two and three-quarter billion poor, is simply not possible without the continued economic growth of the developing nations, and the developed nations as well."

The World Council of Churches official statement at the Stockholm conference puts it more bluntly:

"The point surely is that the environment must strengthen the concern for social justice. Social justice, in the context of a global environment will mean a new look at the relation between environment and development. It has been well said that the problem of a fair and just distribution of the world resources is heightened when it is discovered that these resources, whether of minerals, land, air or water must increasingly be seen as a common heritage of all peoples, and so developed and used."

Depletion of resources, pollution of environment, inequality of global production and distribution - these are the three problems which are now widely recognised as constituting a grave peril for the planet earth and for the survival of man on it. The Club of Rome Report's main default was in leaving out the third factor - that of inequality of distribution - from the programming of the "world simulation model" computer at M.I.T. On the other hand, the inter-dependence of the three factors has been recognised by the E.E.C. in the policy statement issued by Dr. Sicco Mansholt, President of E.E.C Commission (reported in *The Guardian*, April 11, 1972). He proposes the abandonment of the concept "Gross National Product" as the measure of growth, and proposes a still undefined new concept "Gross National Utility," related to the quality of human life rather than the quality of goods and services produced. He recommends "recycling" as solution

for depletion, "non-pollution" as solution for the pollution problem, and a better or more equitable system of distribution on the european economic community basis. He would also recommend a sharp reduction in the production and consumption of material goods and increase in the production of non-material goods and services for the expansion of the mind, for the organisation of leisure and recreation, etc. The focus now shifts from "quantity of goods" to "quality of life."

The same question is being raised from other perspectives, which can only be briefly mentioned here. The most important other field is that of genetics or eugenics. Advances in biochemistry have opened up three possibilities: (a) Negative eugenics - i.e. the elimination of the birth of individuals with defective or undesirable genetic features, thereby improving the over-all genetic heritage of humanity; (b) positive eugenics, i.e. positive encouragement for greater reproduction of progeny from sex cells of parents gifted with valuable or desirable genetic features and (c) genetic engineering - i.e. the manipulation of the genes of existing individuals to change the information coded in the genes, in order to eliminate undesirable characteristics, even to insert new characters/ traits. In this third area, biochemistry is still only on the threshold, and enormous amount of research is further needed before we can apply to human genes techniques found effective in micro-organisms. I leave out of account other possibilities of our technology like (a) artificial manipulation of the human brain itself to promote or inhibit certain personality traits, or (b) euphenics, the possibility to repress biochemically the deleterious effects of genetic diseases like mental retardation without changing the gene itself, which will in due course be transmitted to the succeeding generation, or (c) the determination and transformation of the sex of unborn infants.

These possibilities raise two questions - (a) what criterias are available for deciding desirable or undesirable human qualities and what are undesirable? and (b) who makes the

decisions and controls the techniques related to genetic mutation, and how can we be sure that the technicians themselves will not misuse this enormous power to harm or benefit humanity?

We cannot, here deal with the second question. The first, however, leads directly to the 'quality of life' question raised by the ecological debate, which is the main topic of this paper.

One could mention several other directions from which the same question about the 'Quality of life' keeps coming up. One source is medical ethics. In the context of euthanasia, abortion and the possibility of prolonging the life of patients with terminal diseases, medical doctors are asking the questions - do all lives have the same value? Is it good to live even if living is hell for ourselves and for others? What quality of life has a prior claim on the limited resources of medical science?

Another source is the problem of growing conurbation, or the growth of large urban complexes, and the way things are now going, life in the cities would soon become hell if it has not already begun to be so like in Tokyo, New York and other places. It is not simply a question of adequate housing, transportation and recreation facilities - which are impossible for humanity to provide for our growing urban complexes but we will have a real problem in our hands in a few years. But there has been significant deterioration of the quality of human relations in the city, that life is already insecure, tense, unnursing and dehumanising. Quality of life is becoming thus an important topic in architecture and city planning.

The problem of the quality of life is now already at the centre of our urban-technological civilisation. It is not being alarmist or using the preacher's licence of exaggeration, today to say that our science based technology and the civilisation based on that technology, cannot go on developing in the present way without seriously endangering the life of humanity on this planet.

Neither is it a piece of theological triumphalism to repeat what many scientists are today saying - that science and technology cannot provide the answers for the problems of science and technology.

The basic issue is our conception of the relation between man and "nature" which underlies our science and technology. Already in 1966, Professor Lynn White, the American medieval historian, read a paper before the American Association for the Advancement of Science, accusing the Judaeo-Christian tradition of being responsible for the wrong developments in science and technology which led to the mindless exploitation of nature and the resultant ecological crisis. It is the triumphalist anthropology based on the genesis stories, conceiving of nature as something to be dominated by man, that has led to our present situation, according to Professor White (Paper later published in *Science*, March, 1967, *The Historical Roots of Our Ecological Crisis*).

The Judaeo-Christian tradition has many sins to its credit, but I do not honestly think that Professor White's accusation, which is being echoed by many is fully justified. I wish to submit, first, that the anthropology-cosmology that lies behind our present science and technology is more Hellenic-stoic rather than Judaeo-Christian. I wish also, secondly, to submit that the solutions to the ecological crisis, the quality of life problems, and even to the crisis of science and technology as such, can come only by a shift from the Hellenic-stoic to a properly Judaeo-Christian anthropology - cosmology. Thirdly, I wish to question, the hypothesis being advanced in certain quarters that the alternation to our mechanistic cosmology is a cosmology based on mysticism. Each of these points require one lecture for its presentation. I have to content myself here with a mere indication of the lines along which we have to think on these points.

The Sources of Contemporary Science - Technology

The popular attribution of modern science-technology to the Christian view of Man as free to dominate nature has been seriously questioned by many scholars. It is clear that science-technology did not develop from the beginning of the Judaeo-Christian tradition. If the anthropology of the Book of Genesis could have created science-technology, it should have been born several centuries before Christ. Similarly, this theory does not account for the fact that in many regions of the world where the Christian tradition was dominant, including the orthodox countries and the countries of the middle east, the Christian anthropology did not give birth to modern science - technology. The birth of modern science - technology is due to a fortuitous concurrence of at least five factors: (a) the scholastic training of the mind in the middle ages, which made the shift from the monastic system of education where *lectio* of the *Scrippra* was to lead to *contemplatio*; in scholasticism *lectio* leads to *quaestiones* and *disputatio*, the consideration of various alternative possibilities of stating the truth and the elimination of those found to be false, leaving the one possibility, which then becomes the *veritas*. (b) the revolt against ecclesiastical and theological control of knowledge best exemplified in the French Revolution, thus leading to autonomy and creativity in European thought, (c) the development of the experimental method which flourished in the context of Anglo-Saxon empiricism, (d) the revival of stoic-Hellenic cosmology and anthropology through the Renaissance and the Enlightenment. and (e) the colonial expansion of Europe which on the one hand demanded accurate knowledge and technology for the domination and exploitation of the rest of the world, and on the other hand provided the capital resources necessary for the industrial revolution and the urban-industrial system which fostered science-technology.

If there was an anthropology-cosmology that provided the background for the development of western science - technology, it was the Hellenic-stoic. Since cosmology as

developed in Middle stoicism (second and first centuries BC), by Panactius and Posidonius basing themselves on the work of earlier (3rd century B.C.) store masters Zeno of Citium (the founder) and Chrysippus (the systematizer). This cosmology was based on certain assumptions which are fundamental in modern science - (a) the world is a single continuum governed by universal laws of causality throughout (b) everything in the world is composed of two things in different proportion hyle and pneuma, matter and energy (c) the accurate knowledge of the causal nexus that connects all time and space, would enable man to predict how things will move and to control the movement within certain limits, by providing an immediate operating cause which is within the choice of man.

This lecture is not on the history of science, but on the ecological crisis and the quality of life, and so this matter has to be left here. Blaming the Judaeo-Christian for the ecological crisis may be fashionable, but neither useful nor true.

The Two Tendencies

The important fact is that our system of inhabiting the world, running it and using its resources is in serious trouble, and our present kind of science-technology cannot show us the way out. If one insists, like Jacques Monod does in *Le Hasard et le Necessite* that we have nothing but science and technology to turn to, then we must pessimistically and cynically resign ourselves to the view that we should try to live as best as we can in these circumstances and stoically accept what strict necessity or *anagke-heimarmene* will inevitably bring to us. On the other hand, there are others who are seriously suggesting that we should now move to Consciousness III, repudiating the whole of scientific technological culture with its managerial, bureaucratic-mechanistic approach to life. The demand is for a new mysticism, rooted in the physical (e.g. yoga), relaxed, spontaneous, non-aggressive towards nature, emphasizing play rather than work, promoting expression rather than

repression, and a new freer non-possessive man-woman relationship.

The two tendencies in western culture are going in different directions. Among these who still naively insist that technology can solve all the problems belong, books like Alvin Toffler's *Future Shock*, the Club of Rome's *Limits to Growth*, and Herman Kahn's *The Year 2000*. Their demand is for better control of exploding knowledge through cybernetics; again the problem comes up - how can the general public control the initiated aristocracy of the computer-world, who will hold in their hands the power to inform or mislead the rest of us who have to make the decisions? Among those who suggest the counter-culture line besides Theodor Roszak, we can mention Charles Reich's *The Greening of America*, William Irwin Thompson's *At the Edge of History* and Herbert Marcuse (*One-dimensional Man, On Liberation, Eros and Civilisation etc.*).

Are mechanism and mysticism the true alternatives before mankind today? The question is significant, because survival is what seems at stake. Here is the point at which Christian anthropology questions the very terms in which we are posing the alternatives. Our situation is not that we have to choose between a mechanistic cosmology as derived from the stoics and a mystical cosmology as derived from Pythagoras, Plato and the Neo-Platonists. But behind these two basic cosmologies there stand two *Christian* world views, which are not properly alternates, but two sides of one cosmology. For the sake of brevity, I will call one the technological approach to the world and the other the sacramental. In the technological approach, the basic concern is for the manner in which man knows and operates upon nature, irrespective of the *purpose* for which he does so. In the sacramental view of creation, the manner of knowing and operating upon reality is not in the foreground; but it accepts the world of time and space as deriving its meaning and significance from a realm beyond it, namely from the transcendent creator, and is therefore committed to the use

of the time-space world for one particular purpose namely the manifestation of the goodness of creation, which is its true nature as bestowed by the creator. Both the technological approach and the sacramental approach are properly Christian, when held together, and only when held together. Neither the mechanistic nor the material approaches, are essentially Christian.

The sacramental and the technological held together : This is the authentically patristic view of the relation between man and the rest of creation. To take only one of the fathers as an example, Gregory of Nyssa, man belongs fully to the cosmos, and participates fully in a world whose basic characteristics are to be extended (space) and changing (time) in space-time. "Man finds himself in alteration (*alloiosis*) and change (*trope*)". The creation as well as man is in a continuous process of unfolding, and man participates in this process, both passively as creation and actively as a creator.

If, I may quote, from a Dutch dissertation on the anthropology of Gregory of Nyssa (S.de Boor):

"The participation of total man in the divine life has a two-fold purpose: it makes man into veritable man, and it fully brings out God's glory in His creation.... By means of this participation (in material nature), man mediates God's *doya* to the world; at the same time man is capable of enjoying both sides of the good things around him. Things material are not evil in themselves .... To man, matter is a challenge, asking to be shaped; at the same time it is a threat" (pp.465-466).

Gregory argues that what we call matter has no hypostasis or subsistence of its own, but becomes good or evil depending on the way in which it is used. The transformation of man and the transformation of matter by man are two aspects of one process. Technology and the eucharist have to be held together, in this view. Anthropology and cosmology always go together.

What has happened to our science-technology is that it has become separated from the sacramental understanding of material reality as the bearer of God. For the sake of a quick development of science-technology, western mankind took an exclusively triumphalistic unsacramental one-sided anthropological stance, and there in that faustian exodus begins the deflection of technology from the path of the good. But in that process of technology becoming one-sidedly emphasised, western mankind has very nearly lost the very capacity for a sacramental understanding of reality. This, it seems to me is the saddest part. One cannot simply develop this sacramental sense of relation to God through material reality by just wishing to do so. There has to be a whole re-conditioning of the human consciousness through very intensive corporate disciplines, in order to overcome the alienation from the sacramental sense that has already eaten very deeply into a technological culture. The sacramental mode is the mode of man's participation in the divine through the created reality. Without it man perishes.

Man stands isolated and alienated from both material reality and from his fellow-men, as a result of a technological culture which neglected the sacramental approach to reality. The recovery of community with fellow-man, with history, and with nature, and through these with God, alone can be an adequate basis for the recovery of human nature itself.

Neither a shift from mechanism to mysticism, nor the cybernetic miniaturisation of knowledge, neither zero population growth plus zero economic growth nor bracing ourselves for future shock, can avert the catastrophe ahead of us. Only a corporate return to God, through community and through a sacramental experience of reality worked out in a contest that does not run away from man's responsibility to confront matter through technology, can begin to turn the tide. The quality of life depends on the reality of our relation to the source of life, through our relation to fellowmen and nature.

Conclusion

There is one basic difference between the triumphalist secular anthropology that lies behind contemporary science-technology and authentically Biblical-patristic Christian anthropology. This difference focuses primarily on the relationship between man and reality. Christian anthropology reckons with three basic categories or levels of reality and places man at the middle : God-Man-World is the usual Christian pattern. Secular anthropology relegates God either to non-being or to some insignificant corner of existence, and proudly and triumphantly tries to take over the world in his own right. He has only two levels of reality, man-world, and man wants to be on top. The inevitable consequence is catastrophe as has been shown throughout the ages of history.

Biblical-Patristic anthropology makes four basic assumptions which secular anthropology and western culture are reluctant to accept, but until these assumptions are accepted and their practical consequences worked out, I see no solution to the problems now emerging in secular thought in relation to the quality of life.

The first assumption is that the world open to our senses is not the sum-total of reality, and that the world open to aesthetic awareness is only a lower mode of reality presenting itself to us.

The second assumption is that mankind is a middle reality between God and the World, participating in both poles of reality, i.e., in the energies of the eternal, unchanging, trans-temporal-spatial reality of God, and in the perpetually changing time-space reality of the created order. It is only by remaining in this tension between God and the World that he can remain man and grow to the fullness of his humanity.

The third assumption is that mankind is now caught in a downward spiral of evil, which is called sin, and by seeking to make himself master of the world through science-technology without at the same time being placed in the upward spiral of righteousness, he remains in sin and moves towards death.

The fourth assumption is that all mankind in space and time is one, and when man seeks to make himself as individual or as family as nation or as region or as class or as interest group or as generation the centre of his scientific - technological or religious existence, he again betrays his true humanity.

The fifth assumption is that mankind's double participation in the two poles of his existence, i.e., God and the World, cannot be an intellectual or operational affair and cannot therefore be a matter for science and technology to decide, or for theology to effect. The double participation can be effectively maintained only through the participation in the life of the community of the spirit, through the sacramental mysteries combined with a solid scientific technological mastery of the world. All theology and all science - technology have therefore to be rooted in the sacramental life of the community of the spirit. This does not mean ecclesiastical control of science and technology, but it does mean that human culture as a whole should be penetrated by the Church's participation in the reality of God.

The solution to the grave problems, confronting human existence today is not to run away from the mechanistic world and to escape into the mystical. But it does point to the need for a group of sensitive, intelligent, convinced Christians breaking away from the urban-industrial culture and pioneering a new discipline and pattern of human and Christian existence, committed to the good of the whole of humanity and developing a new consciousness which combines the sacramental koinoistic with the scientific - technological.

CHAPTER 7

Some New Testament Foundations for a Respectful Approach to the Created Order

The other day, I was privileged to be present at a special function at our Indian Presidential Palace, where President Zail Singh was bestowing a privately endowed honour on one of our most creative friends of nature - Sunderlal Bahuguna. Bahuguna is well known and written about, both in India and abroad. He initiated the Chipko Movement, which has been an important factor in the awakening of Indian consciousness on the environment question, particularly in the conservation of forest trees in the Himalayan region. Many of you have read or otherwise heard about the mindless and tragic denudation of the Himalayan forests by thoughtless cutting of trees by the government, resulting in heavy soil erosion, desertification and climate change. Sunderlal Bahuguna, after having tried many ways of stopping the government, finally launched the "Embrace (Chipko) the Trees" movement.

He trained the village people to go and embrace a tree as the government workers come to cut it down. The people understood and took on the concerns of the movement with enthusiasm. Government, at the highest levels, had to make some big decisions to reduce the cutting of trees which would

have been politically impossible without the Chipko movement.

Sunderlal Bahuguna, the author of the movement, is a simple Gandhian. He said, publicly, that even in the green lawns of the Presidential Palace he was ill at ease. He wanted to be back among the forest trees and the mountain people. He very reluctantly accepted the award, and expressed happiness that in the process the movement was being recognized.

In his acceptance speech, Bahuguna made three points which stick to my mind. He is a Hindu, I am a Christian. He gave us three principles for the environmental movement. I will put down what he said in Hindi, in my own words, in English:

1. Nature is to be worshipped, not exploited;
2. One who takes less from nature and society should receive greater respect than one who takes more;
3. There is a richer world inside one, which is more worthy of cultivation than the outside world.

As a Christian, I have to reflect on these principles further. I cannot accept them at face value. And it is in this context that I seek, trusting in the grace of God and in the power of the Holy Spirit, to examine three passages from the scriptures of the New Testament, in order to frame my own principles for the environmental movement.

Let me, first, present to you my own version of the three passages, and then make some comments on them:

1. St. Paul to the Romans 8:18-25

For, I regard the troubles that befall us in this present time as trivial when compared with the magnificent goodness of God that is to be manifested in us. For the created order awaits, with eager longing, with neck outstretched, the full manifestation of the children of God. The futility or emptiness

to which the created order is now subject, is not something intrinsic to it. The creator made the creation contingent, in his ordering, upon hope; for the creation itself has something to look forward to - namely, to be freed from its present enslavement to dis-integration; the creation itself is to share in the freedom, in the glorious and undying goodness, of the children of God. For we know how the whole creation until now groans together in agony, in a common pain. And not just the non-human created order; even we ourselves as Christians, who have received the advance gift of the Holy Spirit, are now groaning within ourselves; for we are also waiting, waiting for the transformation of our bodies and for the full experiencing of our adoption to the status of God's children. For it is by that waiting with hope that we are being saved today. We do not hope for something which we already see. Once one sees something, there is no point in going on hoping to see it. It is there. What we hope for, is what we have not yet seen; awaiting its manifestation, in patient endurance."

2. St. Paul to Colossians 1 : 15-23

He, Christ, the Beloved Son, is the manifest presence (icon) of the unmanifest God. He is the elder brother of all things created, for it was by him and in him that all things were created, whether here on earth in the sensible world or in the world beyond the horizon of our senses which we call heaven; even institutions like royal thrones, seats of lords and rulers; all forms of authority. All things were created through him, by him, in him. But he himself is before all things; in him they consist and subsist; he is the head of the body, the Church.

He is the New Beginning, the first-born from the dead; this way he becomes in all respects pre-eminent. For it was (God's) good pleasure that in Christ all fullness should dwell; it is through him and in him that all things are to be reconciled and re-harmonised. For he has removed the contradiction and made peace by his own blood. So all things in the visible earth and in the invisible heaven, should dwell together in him. That

includes you, who were once alienated, enemies in your own minds to God's purposes; immersed in evil actions; but now you are bodily reconciled in his fleshly body which has tasted death. Christ intends to present you holy, spotless and blameless, in God's presence, if you remain firm in the faith, rooted and grounded in him, answering from the hope of the good news you have heard; the good news declared not only to men and women on earth, but to all created beings under heaven. It is this gospel, that I Paul, have also been called to serve."

3. Gospel according to St. John 1:1-5

At the source-spring of all, the Logos is and was. The Logos is God's presence, and the Logos is God. It is this Logos that in the beginning was face to face with God. It is through the Logos that all existents have come to exist. Without him not a single thing could come into being. In him was also life. Life is light in human beings. The light shines in the midst of darkness. The darkness did not comprehend or overcome the light."

I want, as a Christian, to draw my own three principles for a more respectful approach to the created order. At the end, we shall compare our principles with Sunderlal Bahuguna's.

i. *Human redemption can be understood only as an integral part of the redemption of the whole creation*

We have been conditioned, for a long time now, to understand the redemption in Christ, in terms primarily and too often exclusively of personal salvation. A basic requirement for a healthy Christian approach to the human environment seems to be a shift of gears in this regard.

What is a "person" whose salvation Christ effects? A person exists only in relation : in relation to other human persons (father and mother to begin with) and to non-human realities (light, air, water, food etc.). It is not possible for a human person

to come to be or to grow without relation to other persons and things. The earth and the sun as well as other people are an essential part of my existence. Without them I cannot exist.

Both the Pauline and the Johannine witnesses in the New Testament strongly affirm this redemption of the whole creation - cosmic redemption, if you like, or the participation all creation in the liberation of humanity from the bondage to sin and death.

This is in strong contradiction to the Gnostic-Hellenic-Hindu notion which is most characteristically expressed by Plotinus, the founder of so-called Neo-platonism in the third century:

> "No, if body is the cause of Evil, then there is no escape; the cause of Evil is Matter" (Enneads 1:8:8).
>
> *Thus, it is quite correct to say at once that Matter is without Quality (in itself) and that it is evil; it is evil not in the sense of having quality, but precisely, in not having it" (Enneads 1:8:10).*

The body is, in this tradition, the source of bondage and evil. Unfortunately, this tradition is very strong among Christians also, who like Hellenists, Hindus and Neo-platonists, believe that the soul alone is to be saved, and that the body or other material objects, whether living or non-living do not participate in or benefit from the redemption in Christ.

This gnostic influence in Christianity is what has pervaded our understanding of the Old and the New Testaments. Why do we magnify the prophetic and under-play the priestly in the Old Testament? Is it not the case that the Old Testament gives just as much, if not more, prominence to the priestly as to the prophetic? We prefer the prophetic because it fits better with out gnostic temperament which despises the material and the corporate, the sacrificial and the ritual, and refers the individual soul and the prophetic word as our focus of attention. I will come back to this point later, but here we need to affirm only what St. Paul and St. John so strongly affirm,

contrary to the Gnostic-Hellenic-Hindu tradition, and in the true spirit of the Old Testament, that the whole creation and not just a few human souls, have been redeemed and reconciled in Christ.

Human beings have existed, and do exist, only as integral parts of a system which includes sun and earth, light and water, air and fire, as well as wheat and potatoes, meat and vegetables. To make a false distinction between "nature" and history, and to limit the presence and action of God to history, and to deny God's action in "nature," cannot be regarded as Christian.

Neither "nature" nor "history" in our sense are biblical notions. Nature or *phusis* in Greek, in the sense of non-human self-existent reality, does not occur in the Old or New Testament, and is a notion alien to the biblical world. In so far as the word 'nature' refers to something as it exists by itself, it is contrary to the Johannine affirmation that not a thing came into being without Christ the Logos. If the Old Testament uses the word 'nature', it is only in the book of Maccabees, and puts the word in the mouth of a Greek (Antiochus) rather than of a Hebrew. (on this, see *Human Presence* p.20 ff. of Metropolitan Paulos Mar Gregorios Ed.). In fact, there is no Hebrew word for nature. Hebrew can speak of creating (bara) as a verb, but it seldom uses beriah, a feminine noun, in the sense of the whole creation. It does not make an entity out of the creation, though it recognizes the act which produces and sustains the creation.

The Old Testament may make all the trees of the wood rejoice (Ps. 96:12), or ask the trees and animals to praise the Lord (Ps 148), but it does not speak about 'nature' or the "creation" as an entity representing the whole created order.

The Old Testament does not have a notion of 'history' either, as a realm apart from nature. The New Testament also does not speak of 'nature' as the ensemble of created entities. If it uses the word nature (in expressions like *phusis, phusikos, kata phusin*), it is to distinguish between natural and unnatural,

or natural and artificial (see Rom 1:26, 27;2:27, 11:21.24) or to speak about what is spontaneous or connatural. It can speak of our being partakers of the divine nature (*theias koinonoi phuseos*). 2 Pet 1:4 literally means "sharers in the nature of the Godhead"), but not of any nature existing independently of God.

Neither is the noun "history" (Gk. *historia* from *historeo* - to see, visit, enquire or learn by enquiry) a common biblical notion. Certainly, the Bible does not know a God who acts in 'history' but does not act in 'nature'. A *historia* is a carefully researched narrative of a series of events, not a realm of exclusively human or divine action, unrelated to nature. The noun history does not occur in the Hebrew or Greek scriptures, and when the verb occurs once (Gal 1:18) it means visiting someone (to visit Cephas).

We have so distorted the biblical perspective on redemption by introducing alien categories like 'nature' and 'history' into it, or by understanding redemption in terms of souls and persons only. Liberalism and neo-orthodoxy, in reacting against the exclusive emphasis on personal salvation, fell into the trap of false categories like God acting in history but not in nature, or of 'history' rather than 'nature' as the realm of God's revelation. This can be traced to a Gnostic bias which detests nature and sacrament as material, but can see 'history' and 'word' as somehow non-material and (therefore?) spiritual.

A new understanding of the redemption in Jesus Christ will then have to take into account at least the following integral relations:

a. *Personal* and *Corporate* salvation:

b. *Spiritual* reality and *material* reality in the creation and in the Incarnation;

c. the *created* order as the object and field of the *redeeming* order; and

d. the human *person* as integrally related to the whole *cosmos*.

Once these relations are kept in mind, we will have a picture of our own faith which will facilitate a more respectful approach, not to 'nature', but to the created order as a whole. The continuity between the order of creation and the order of redemption, rather than their distinction and difference, should be the focus of our interest. Man is redeemed, *with* the created order, not *from* it.

ii. ***Christ himself should be seen in his three relational dimensions, each of which is related to each other: (a) to members incorporated into his body: (b) to the human race, and (c) to the other than human orders of created existence in a many - planed universe***

Such a christology will not conceive of a Christ as somehow other than the created order. Now much of christology sees Christ and world, Christ and culture, as two separate entities. We try to affirm the Lordship of Christ *over* world and culture, by conceiving even the incarnate Christ as somehow totally distinct from the created order. We then think of him as Lord of the world, Lord of the Church etc. Or else, in the more individualistic versions of christology-soteriology, some make him "sole mediator" between me and God. The perception is in terms of three realities - God-Christ-Me. God is there, I am here, and Christ stands in between. And the world or the Church are fourth and fifth realities.

This kind of disjunctive thinking has to give place to an integral and participative way of understanding Christ. Jesus Christ is not an abstract or 'purely spiritual' entity. He is incarnate. He took a material body. He has become part of the created order, while remaining unchanged as one of the three persons in the trinity who is creator. He is one of us. He is fully consubstantial with us.

a. We are united with him, as Christians, in a specially intimate way. By baptism and by faith, he has incorporated

in us to be members of his body. By participation in his body and blood, we grow to be integral parts of him. Once he had a human body like ours. He still has a human body - it has already, however, become a transformed and resurrected body, not subject to the ordinary laws of our physics, which govern only mortal bodies and material objects. But he has chosen to have a larger body, partly in heaven (i.e. beyond the horizon of our senses) and partly here on earth. We belong to that body as a whole, but particularly to the earthly part of it. Christ always exists with his body also when he continues to fulfil his ministry as high priest of creation and as prophet and servant of the world. Our faithfulness or otherwise affects the whole of humanity, the whole cosmos.

b. But Christ, the Incarnate is a human being - consubstantial with all other human beings. He became a human being, male and female. The whole of human nature has been assumed by him, and there is now no humanity other than the one which Christ took - our humanity in which all human beings participate, whether they believe in Christ or not, whether they recognize the nature of their humanity or not. This aspect of the Redeemer's relationship to the whole of humanity, independent of human faith, is seldom fully recognized by Christians and its implications worked out. No human being is alien to Christ, whether he be Christian, Hindu, Muslim, Communist, or Buddhist. They share in Christ's humanity in ways that we have to spell out elsewhere. They are not members of the Body of Christ, but they are not unrelated to Christ. And since Christ assumed humanity and loves humankind, the Church can do no other.

c. But Christ, the Incarnate one assumed flesh : organic, material, physical human flesh, was nurtured by air and water, vegetables and meat, like the rest of us. He took matter into himself. Matter is not alien to him now. His body is a *material* body, transformed, of course, but

transformed matter. He shares his being thus with the whole created order - animals and plants, snakes and worms, flowers and seeds. All parts of creation are now reconciled to Christ. And the created order is to be set free and to share in the glorious freedom of the children of God. Sun and moon, planets and stars, pulsars and black holes, as well as the planet earth, are to participate in that final consummation of the redemption. Humanity fell, and the world too has fallen. Death rules not only in humans but in the whole of the earth.

The risen Christ is thus active now, by the spirit, in all three realms: in the Church,in humanity as a whole, and in the cosmos as a whole. The relationships at the three levels are fundamentally different, but they are real and meaningful relations to Christ the Incarnate one.

Our theology's weakness has been in the failure to recognize the wider scope for the redemption beyond the "individual soul" or the person. Liberalism, still spiritualises the incarnate Christ by confining his actions to so-called "history," as if that were a realm in which "nature" or the material elements of creation were not present.

We have to move beyond personal salvation to declare and teach the three basic dimensions of the redemptions in the community of faith, in humanity at large, and in the cosmos as a whole.

iii. ***Christ and the Holy Spirit are related to the whole Created Order in three ways : by creating it, by redeeming it, and by finally fulfilling it in the last great consummation***

There is no need to elaborate these points. The act of creation is a corporate act of the three persons of the trinity. God's relation to plants and trees, to air and water, did not begin with the redemption in the incarnate Christ. There is not a thing now existing which came into being without Christ and the Holy Spirit, including the primeval water over which the Spirit

was hovering at the time of creation (Genesis 1:2). Neither art nor literature, neither mountain nor river, neither flower nor bacteria, came into existence without Christ and the Holy Spirit. They now exist, because they are sustained in existence by God. The creative energy of God is the true being of all that is. Matter is spirit or energy in the form of mass. We should regard our human environment therefore as the energy of God in a form that is accessible to our senses.

We have already discussed the relations of the human environment, of the whole cosmos to the redemption. It is a redeemed cosmos that we meet in our environment, and it is worthy of respect as such.

It is the final *apokatastasis*, the fulfilment at the end that still needs to be stressed. The consummation, which St.Paul calls *anakephalaiosis* means adding up (Eph 1:10) everything i.e. the consummation of the whole created order in Christ. Take the three numbers 5, 7 and 14. When one adds them up one gets 26. At first sight it may not be obvious that the three numbers are contained in the larger number; but they are there; they are not lost. There is a process analagous to this in the final *apokatastasis*, about which St.Peter preached in Solomon's Portico in Jerusalem. 'Christ Jesus, whom the unseen realm must keep until the times of the final restitution of all things, about which God spoke through the mouths of his holy ones, the prophets from ages ago" (Acts 3:21).

In the Christian understanding the status of the world, of all life and of inorganic matter, is determined by the three factors:

a. How did they came to be and how are they sustained?
   (answer : by creation)

b. How does the Incarnation of Jesus Christ affect them?
   (answer: they share in the destined freedom of the children of God), and

c. What is their final destiny?
   (answer: to be incorporated, through transformation, in the new order which fully emerges only at the end, in the final recapitulation. The whole created order comes from God the Holy trinity, is redeemed by the incarnate Christ, and will be brought to fulfilment after transformation, by the same Christ and by the Holy spirit the perfecter of all.

Once these Christian teachings are fully assimilated, we are in a position to look again at Sunderlal Bahuguna's three proposals.

Christians cannot say that nature is to be worshipped and not exploited. Christians would say that the created order (not nature) is to be respected as the order which has given birth to us, sustains us, and will still be the frame work for our existence when the whole process of creation-redemption has been consummated. We respect it, both because it comes from God and is sustained by Him, and also because it is the matrix of our origin, growth and fulfilment as human beings. We do not worship the creation. Worship is reserved for the creator. We have to tend the creation, using it for our own sustenance and flourishing, but also to respect it in itself as a manifestation of God's creative energy and to co-operate with God in bringing out the full splendour of the created order as reflecting the glory of the Creator.

As for Bahuguna's second principle that one who takes less from nature and society is to be more honoured than one who takes more, this also seems doubtful for Christians. Simplicity of life is a high value, but enforced poverty is not. And the poor are to be respected, not because they take less from nature but because they are the friends of God and victims of injustice. Both are options for Christians - the simple life *a la* John the Baptist, who lived on locusts and wild honey in the desert, and the normal life of our Lord who prayed all night and worked all day, but ate and drank with others to the point where he was called a glutton and a wine-bibber. Neither of

these life-styles would, however, justify the mindless affluence of our consumer society. To impose austerity on a society may be unwise but it is even more unwise to impose affluence on a nation through hidden persuasion, in order to make some people more affluent than others. In taking what is given by "nature," we should be careful to give back to "nature" what it needs for its own integrity and for the needs of the future.

Finally, about the inner universe which awaits care and development, Christians need not despise or reject the outer world in order to develop the inner world. And we should not, as Christians, think of the inner world as an individual realm. We speak rather of the unseen, of the heavenly, of that which lies *beyond* our senses. It is a different perception, as for example when St.Paul says:

> "If then you have co-risen with Christ, seek the higher things, where Christ now is, enthroned at the right hand of God. Meditate and will the heavenly realities, not the earthly ones" (Col. 3:1-2).

We don't speak of the inner world, but of the final fulfilment which is already present in the realm beyond our senses, and which moves our world as its norm and goal now. Even when thinking about the environment or socio-economic and political life - *Ta ano phroncite* - focus your mind and will on the higher realities (not the inner), which must be manifested in the earthly realities; now partially, but in the end fully.

CHAPTER 8

The Nature of Nature

1. The Concept Clarified

The paradox in our present ecological crisis and our conception of nature has been ably brought out by Gordon Kaufman.[1] Nature has been and is being transformed by human cultivation, human technology and human culture. But humanity forms an intrinsic part of this nature, if nature really means the sum total of all beings and processes. Human culture in that perspective is part of nature. The paradox refers to the dilemma between the inclusive and the exclusive view of nature. Some writers, like Frederick Elder claim that it is this exclusive view that has led to the ecological crisis, that the Christian tradition is strongly exclusive and is therefore responsible for the crisis, and that only an inclusive view holds out the possibility of survival for humanity.[2]

Once again, we seem to be heading for a false set of alternatives on which we can debate furiously without coming to any conclusions. Does the concept of "home" imply only a

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[1] "A Problem for Theology: The Concept of Nature," *Harvard Theological Review* 65 (July 1972), pp.337-366.

[2] F. Elder, Crisis in Eden: *A Religious Study of Man and Environment* (Nashville: Abingdon, 1970).

furnished house, excluding the people who live in it, or is it an inclusive term which takes them into account. The question is ridiculous, for the answer depends entirely on the context in which the word "home" is used. Similarly, even if we accept a view of nature as including humanity, there will still be some contexts in which only the exclusive view will make sense.

It is the very concept of nature that in itself is problematic. Human culture and history are certainly part of the ongoing process of reality. The question is, whether nature is the right term to describe the sum total of this reality including humanity, or does the very term amount to a distortion of that reality?

In modern usage there are several sets of meaning for the word "natural" or "nature."

a. In ordinary secular language, "natural" is opposed to contrived or artificial, i.e. something which happens or comes into being without human intervention. We could say that the reference here is to the "laws of nature" or the "order of nature," which operate independently of human intervention. This is nature as the realm of unalterable physical laws, nature has given.

b. In modern western languages, nature has come to have a related second meaning viz. the non-human part of creation. When we speak of the beauty of nature, or of caring for nature, we do not mean the order of nature, but rather the visible aspects of creation around us. But this concept excludes man-made elements. For example, the city, or at least the complex of buildings, bridges, tunnels and highways made by human beings does not form part of nature; rather it is made up of elements of earth, air, water and sky, together with plant and animal life.

c. In Christian theology, nature has two other meanings.

   i. "Nature" is opposed to "history" and "culture," which are the realm of human action. Protestant theology since the 19th century has tended to emphasize the action of God in history as the central revelation, while usually underplaying his visible activity in nature. The concept of natural revelation has seemed dangerous, since it may justify the knowledge of God in other religions.

   ii. This Protestant distinction between "natural revelation" and "special" or "historical" revelation has its predecessor in the medieval Roman Catholic distinction, still current, between nature and grace, or between the natural and the supernatural. Grace is God's special and direct action, while nature is given, and has its own laws. Grace can counteract, supplement or overcome nature; it comes from outside or from above nature, and hence is qualified as supernatural.

d. Underlying all the above meanings of the word "nature" is another: the given structure or constitution of a person or thing. It is not in the nature of a cat to fly. The hawk and the wolf are by nature cruel. Here, the reference is both to the given behaviour pattern and the expected character of an entity.

We shall have occasion to refer later to these four meaning-contexts,[3] but it will be useful here to analyse here the assumptions behind them.

First, the various usages of the word reveals very important metaphysical assumptions. Would it not be correct to say that the western classical world-view has a sophisticated three-starry universe than the much lampooned ancient three-tier structure of hell, earth and heaven? At the lowest level of this new three -storey structure is nature as an order with its own given constitution, for both the whole and its parts. On the top level is the realm of the special actions of God, to which terms

[3] For a fuller discussion of the meanings of the word, see R.G. Collingwood, *The Idea of Nature* (New York: Oxford, 1945) or C.F. von Weizsäcker, *The History of Nature* (Chicago: University of Chicago Press, 1959), or in a briefer framework, Kaufman, *op.cit.*

like revelation, grace and the supernatural refer. Let us call this total structure nature-culture-grace. Under culture, we would include not only history as economic, social and political action, but also science and technology.

The modern ecological debate seems to be concerned with what the second tier does to the first. The new sin, condemned in strong language like " earth-rape" and "terricide," is what we as a human race have done and are doing to "nature." Civilization is attacked not only as a flight from nature but as a brutal and unfeeling assault on it. No overt reference is made to the realm of grace, though demands for a theology of nature or for an ecological theology are often heard.

2. Nature in the Bible

We need now to clarify the concept of "nature" from a theological perspective. The Hebrew tradition is often accused of having de-sacralized nature and thereby paved the way for its pillage by humanity. But it is a striking fact that this tradition has no word at all for what we call nature. An examination of the Greek concordance for the Old Testament [4] confirms that the Greek word for nature, *physis*, occurs only in the later books produced outside Palestinian Judaism in the diaspora living under Greek influences, i.e., in the Book of Wisdom and in the III and IV Maccabees. These books are regarded as apocrypha by Protestants and others, and do not even appear in the Protestant Old Testament, which follows the canon of Palestinian Judaism.

In other words, it could be said that the concept of "nature" is totally alien to the Hebrew tradition as such. Those who have too easily credited the Old Testament doctrine of creation with making it possible for western civilization to know and control

[4] Hatch and Redpath, *Concordance to the Septuagint* (Oxford, Clarendon Press, 1987) gives the following instances: Wisdom 7:20, 13:1, 19:20, III Maccabees 3:29, IV Maccabees 1:20, 5:7, 8:25, 13:27, 15:13,25 and 16:3.

nature (a totally indefensible claim, in any case), should note that the Hebrews had no notion of something "out there" which they were to set about "desacralizing" and then dominating. The command of Yahweh, in the book of Genesis was certainly not " to dominate nature" but only to " be fruitful and multiply, and fill the earth and master it, and have rule over fish of the sea and over the birds of the air and over every living thing that moves on the earth" (Gen. 1:28). Mastering the earth and all life on it need not mean mastering "nature" as a whole, which is a much wider concept.[5]

This is to say that in the Old Testament tradition, nature is not conceived of as an entity to be dominated. In most instances, even in the apocrypha, the Greek word *physis* is not used to mean nature in the sense of the non-human part of creation, or as the whole of creation. It is worth quoting, as an example in IV Maccabees 5:5-8. The book is an apologetic tract glorifying the defence of Judaism against the encroachment of Hellenic culture. The context of the passage, is the cruel though courteous demand of the tyrant Antiochus Epiphanes to the venerable Jewish high priest Eleazar, that the latter saves himself from torture by eating swine's flesh, which is forbidden for him by the law of Moses.

> And Antiochus, looking on him (i. e., Eleazar) said, 'Before I allow the tortures to begin for you, o venerable man, I would give you this counsel, that you should eat of the flesh of the swine and save your life; for I respect your age and your grey hair, although to have worn them for so long a time and still to cling to the Jewish religion, makes me think you no

[5] It should be remembered not only that the Old Testament has no word for nature (inclusive or exclusive), but that it has no word for what we call the 'universe'. The closest it comes to this is "heaven and earth." The word *olam*, which many writers view as an Old Testament concept for the universe, does not occur very frequently. In 99 percent of the cases, it is used to mean 'forever', 'everlastingly', rather than the 'world.' The closest equivalent to an inclusive sense of nature in the Hebrew scriptures is *tebel* - the inhabited or 'hominized' earth - parallel to the Greek *oikumene*.

philosopher. For most excellent is the meat of this animal, which Nature has graciously bestowed upon us, and why should you abominate it? Truly, it is folly not to enjoy innocent pleasures, and it is wrong to reject Nature's favours.....' [6]

Clearly, it is not the Hebrew who says that nature gave us the pig. Only someone with a Greek education could make this statement, Eleazar's reply contains the word "nature," but he uses it in the sense that God has compassion on the weakness of human nature. Even in this pseudopigraphical work, composed under the influence of Greek culture, the Hebrew uses the word "nature" only to denote the God-given constitution of humanity, not the non-human part of creation. In all the other instances where *physis* is used in the Greek Old Testament, it has this same meaning.

The New Testament, also produced under heavy Greek influence, still makes but sparing use of the concept of nature, and only in the classical sense of the God-given nature of an entity. St. James 3:7 and II St. Peter 1:4 are clear instances of this. St. Paul also uses the word *physis* with this meaning. He speaks, for example, of the "natural branches" (τῶν κατα φυσιν κλάδων) was opposed to branches grafted on (Rom. 11:21,24) or of the Gentiles, not having the law, by their very nature φυσει doing the things of the law (Rom. 2:14). For St.Paul, "by nature" could mean "by birth," as when he speaks of "you who are by nature Jews" (Gal. 2:15). But the basic meaning is that of "constitutive nature" as, for example, in the reference to the service of those who by nature φυσει are not gods (Gal. 4:8). In fact, St. Paul even thinks that "nature" itself ἡ φύσις αὐτή teaches us that it is not very laudable for men to wear long hair (I Cor. 11:14), though very pious Greek and Slavonic monks and many not-so-pious moderns defy this teaching. The reference in Ephesians 2:3 to those who are "by nature children of wrath" is a bit more difficult to unravel, for if nature is what is given

[6] IV Maccabees 5:5-8, Eng. tr. R.H. Charles, *The Apocrypha and Pseudopigraphm of the Old Testament* (Oxford, 1913), Vol. II, p.672.

by God, it is not easy to see how people can be destined to his wrath by the very fact of their origin. But nowhere in the New Testament, does the word "nature" refer to the whole of creation or to its non-human aspect. That, it seems, is a Hellenic legacy in western Christian thought.

Nature : An Indo-Hellenic Concept

Though the concept of nature itself is basically Aristotelian in its early Greek provenance, among the Stoics it received a currency and value not given it by Aristotle. Nature is the Stoic equivalent of the soul of the world, the *pneuma* that animates it, the seminal logos entirely immanent in the world. Aristotle had not used the word "nature" in quite that sense; for him the cosmos was animated (en-souled) by and had within it the principle of movement.[7] Thus, for both Aristotle and the Stoics, nature itself was a God-substitute. They used the terms synonymously,[8] but for an immanent, self-animating principle in the universe, not for the whole of creation.

The key concept used by the Stotics - the idea of the *anima mundi*, world-soul, - is much more ancient among the Greeks than are Plato and Aristotle, both of whom also employ it. It is likely to play a large part in our own thinking in the near future, for ours is also a God-less world forced to concede that its own existence and processes need some explanation. As the technological crisis deepens, we will need more and more vitalist interpretations of the universe. Bergson, Whitehead and Teilhard may come back into greater currency, because all three are essentially vitalists operating with a concept very similar to that of the world-soul.

The idea of the world-soul has affinities with Hindu thought also, though the precise concept of a *lokatma* or

[7] ὁ δ'οὐρανὸς ἔμψυχος καὶ ἔχει καὶ ἔχει κινήσεως ἀρχὴν *de caelo*, B 2, 285 a 29-30; see also *de gen. anim.* B 6, 744 b 16-17; *de Caelo Bs*, 288 a 2.

[8] ὁ δὲ θεὸς καὶ ἡ φὺσις οὐδὲν μάτην ποιοῦσιν was a common dictum to which Aristotle refers in *de Caelo*.

prapanchatma (world - soul or cosmic soul) is hard to find in the rich Hindu tradition. The idea of the ultimate self or *paramatma* in the Upanishads, however, is not far from the notion of a world-soul, nor is the idea of the Inner Self (of the world) or *antaratman* to which the *Katha Upanishad* refers,[9] and which it identifies with the human soul itself:

> *The Inner Self of all things, the One Controller*
> Who makes his one form manifold -
> The wise who perceive Him as standing in oneself,
> *They and no others, have eternal happiness.*[10]

In fact, all the Upanishads seem to use this concept of the world-soul, always, however, identifying it with the ultimate soul of God and the personal soul of the finite individual. It is usually conceived in relation to a transcendent *Brahman*, until we come to the *Samkhya* system of Hinduism, which is basically non-theistic or atheistic.

Even the Gita, which belongs to a later period than the Upanishads, maintains this clear tradition of a transcendent universal self, immanent in the universe as its soul. In the great self -manifestation of the ultimate soul through Krishna to Arjuna, the latter saw " the splendour of that exalted Being" as " if the light of a thousand suns blazed forth all at once in the sky,"

> There the Pandava (Arjuna) beheld the whole universe, with its manifold divisions gathered together in one,in the body of the God of Gods.[11]

This concept of the universe as the body of God received central importance in the Hindu tradition with Ramanuja (11th century), and even in Madhva (1197-1276). The organic

[9] *Katha* v. 9-12, Engl. Tr. Radhakrishnan and Moore (eds.), *A Source Book in Indian Philosophy* (Bombay: Princeton and Oxford University Press, 1957)

[10] *Katha* v.12.

[11] *Radhakrishnan and Moore* (eds.), *op.cit.*, p.139.

understanding of the world is still fully dependent on a transcendent God.

A non-transcendent system, parallel to that of the Stoics among the Greeks, occurs in the fully orthodox Hindu system of Samkhya, which is now drawing the attention of many westerners. The Samkhya system is also noted for its theory of organic evolution, though this is stated only as a rudimentary insight and not as scientific theory. Even more noteworthy in the Samkhya system is the reduction of all categories to two basic entities: person (*purusha*) and nature (*prakrti*). This corresponds to the basic dualism of all empirical knowledge between knowing subject and known object. *Prakrti* or nature is a force, not a static being, having within it various grades or levels of qualities, *gunas*, constituting a progression. These qualities in their interaction produce the world-manifold. But the highest level of evolution of *prakrti* takes place only when *purusha* - the conscious person - excites it and leads it on to its own progressive unfolding.

This school of Hinduism, which flourished around the seventh century B. C., is much older than Plato, Aristotle and the Stoics. Unfortunately the earliest Samkhya writings to which we have access date only from the third century A.D.[12] Dismissing openly and completely the concept of God or *Isvara*, the Samkhya philosophy makes nature or *prakrti* the producer of this world, through the manifold combination of the various constituent *gunas*.

Thus, we see that "nature" is essentially an Indo-Hellenic concept, especially in the sense of an impersonal entity confronting man. In both the Hindu and the Hellenic traditions, "nature" in this sense becomes a necessary concept, particularly in systems that do not attribute the existence of the universe to the activity of the one God. Greek paganism was basically

[12] *The Samkhyakarika of Isvarakishna*, ed. and tr. S.S.Suryanarayana Sastri (Madras, 1935). See also *Source Book*, *op.cit.*, pp.424-452.

atheistic. Their gods were in most cases, only exalted human heroes or personified cosmic power. The concept of nature functioned as an originating and normative principle, in the absence of the notion of a God who created and sustained the cosmos. The same is true of Hinduism. It is only in the athestic system of Samkhya that "nature" in the sense of the non- human part of the universe comes to play a central role.

It is, therefore, not surprising that the concept of nature as the non-human part of the universe, became prominent in the western tradition only in its post-renaissance, secularist phase, when the centrality of God began to give place to anthropo-centrism. Goethe, Wordsworth, and Shelley belong essentially to this phase, though none of them was openly atheistic. For Goethe, conversation with nature was a way of perceiving the *Urphaenomen* in it, but he was angry with the technological culture which did not know the right kind of conversations to have.

In this sense, there is a usual dialectical ambiguity in the present revolt against technology and in the preference for direct, unitive, reverent perception of and communion with nature. Both the scientific-technological and the romantic-unitive approaches to "nature," as the counterpart and companion of humanity, hide the basic truncation inherent in that artificial construct of reality which belongs to the classical western Christian tradition, i.e. grace-man-nature. The first aspect becomes almost non-operative in the confrontation between humanity and nature in post-renaissance western culture, particularly in the enlightenment. This idea should be developed further; we simply note here that nature as the non-human part of creation plays a more central role in human perception and poetry when the first aspect viz. God's grace becomes recessive.

3. Nature in the Writings of the Fathers of the Church

The Fathers of the Christian Church , true to their Greek genius, make free use of the concept of nature.[13] When, for example, Origen speaks of the unbegotten nature of God τὴν ἀγέννητον θεοῦ φύσιν[14] or of the "super-substantial breed" being con-natural to rational creatures[15] and when St. Gregory of Nyssa refers to God as by nature incomprehensible[16] they are using the word with its meaning of constitutive nature, and we shall make but scant reference to these. The Fathers do make frequent use of the term *physis* in this sense; Mark the Hermit, capped off the discussion by distinguishing between what is according to nature κατὰ φυσιν and what is above nature or super-natural παρα φυσιν.[17]

We are concerned here with the Fathers' reflection on nature in that other sense of the word: the whole of creation, sometimes including humanity, sometimes not. But in this connection, we should turn from the word *physis*, or nature, to the words *ktisis* or *ta panta*, both of which mean the whole of creation. The Fathers have a strong sense of the laws constituting the nature of all things, but in general they do not call the creation "nature." There are, however, some exceptions to this. For example, the whole creation is referred to as *physis* in Tatian.[18] In later Greek writings, such as the anathemas of the Council of Constantinople in 543, the universe is called the "whole corporate nature" πᾶσαν τὴν σωματικὴν[19] But more often than not, when the Fathers speak

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[13] It is ossible to give here only a sampling of the patristic literature on the subject of nature and the furious debates about Christ's nature which led to the unfortunate and unproductive schism of the Church in the fifth and sixth centuries will be almost completely omitted.

[14] *Contra Celsum* 4:38 PG 11:1089 B.

[15] *de Oratione* 27 PG 11:513 A.

[16] e.g. *Life of Moses* PG 44:376 D.

[17] See *Opusculum* 2:83 PG 65:1104 A. τρεῖς εἰσιν νοητοὶ τόποι εἰς ὅνς ὁ νοῦς ἐκ μεταβολᾶς εἰσέρχεται κατὰ φύσιν παρὰ φύσιν ὑπὲρ φύσιν.

[18] *Oratio* 21, PG 6:853 B.

[19] See *anathema 6* in A. Hahn (ed.), *Bibliothek der Symbole und Glaubensregeln der Altern Kirche*, second ed. by L. Hahn (Breslau: Verlag von E. Morgenstern, 1877).

about creation, they use ἡ παση κτίις, the whole of creation, or simply τὰ πάντα "the all," everything that is.

It is clear, in St. Gregory of Nyssa, who laid the foundations for later Christian reflection on the subject, that the basic distinction for patristic literature is not between humanity and the non-human part of creation, but between " He who truly is" ὄντωςὤν and "the things which merely exist"τὰ πάντα. The two do not share the same mode of beings, and to apply verbs like "is" or "exist" in the same sense, to both God and the creation, seems to Gregory to be disastrous.

This is important, if rather obvious. The Fathers were never able to keep their terminology sufficiently clear, even when they were aware of the distinction between the being of God and the existence of creation. They applied the word *ousia* or "being" to both. St.Basil and St. Gregory, his younger brother, both spoke of *physis* (nature) or *ousia* (being) as parallel entities[20] and John of Damascus, in the eighth century systematized the parallelism.[21]

Valentinus Apollinaristes, in the fourth century actually identified *physis* and *ousia*.[22]Eusebius of Caesarea (fourth century) held that each reality had an intelligible and a sensible aspect, and that *physis* refers to the intelligible and non-corporeal, while *ousia* refers to the particular existence which is seen in change and decay as a corporeal entity.[23] He was, however, philosophically unsophisticated, for when the Christian writers refer to the *ousia* of God, they do not mean a corporeal entity subject to change and decay. Gregory of Nyssa, only a few years later, gave a more defensible definition

[20] St. Basil, *Adv. Eunomium* Bk. I: 12ff. PG 29:540C-541C; St. Gregory: *Contra Eunomium* 8. Jeeger (ed.), Vol. II, p.202-29ff, PG 45:800B.

[21] *de Fide Orthodoxa* 3:4 PG 94:997A.

[22] φύσις... καὶ οὐσία ταντόν ἐστιν... καὶ πάντες... δῖ τῆς αληθινῆς πίστεως ὁμολογηται τοῦ γινώσκουσιν *Capita Apologiae* PG 86:1957 A (*Physis* and *ousia* are the same, and all who confess the true faith know this).

[23] *Praeparatio Evangelica* II:9 (E.H. Cifford (ed.), Oxford, 1903), p.524A PG 21:868D.

of nature: "nature" or *physis* was that in which the existence of being was comprehended. But, here again, he was not referring to the *ousia* of God, since he held this to be incomprehensible. St. Maximus, the Confessor (sixth century) went the same way in asserting that in patristic writings *physis* and *ousia* are similar and have common features in meaning.

Late in the seventh century, the concept of *physis* took on more precision as the identifiable qualities of a class of persons or things, while *ousia* referred to simple existence. John of Damascus, said that some philosophers of other faiths made a distinction between *physis* and *ousia*. For them *ousia* meant "simply being" ἁπλῶς εἰναι, while *physis* referred to the "mode of being" τὸ τοιῶσδε εἶναι which made possible the classification of beings into species and genera.

Thus the word *ousia*, which in some instances is applied to the unique mode of being of God, was sometimes used to mean simple existence. Moreover, the Fathers do not mean by "nature" the reality that surrounds us and can be known through our senses, but the constitutive and identifiable qualities of each separate type of being.

4. He Who Truly Is and Things Which Merely Exist

Greek pagan philosophy had already used τὸ παν, "the whole," to refer to the universe;[24] τὰ πάντα, "all things," emphasizing its diversity (rather than the singular which stresses unity), was rarely used.[25] However, with the fourth-century Greek Christian Fathers, the plural came to be preferred. On the one hand, the Fathers were reluctant to ascribe total unity to a universe which participated in the sin of humankind, and, on

[24] Liddell and Scott cites: Empedocles: Frag. 13; Pythagoras according to Aristotle: *de Caelo*: 268aII; Plato: *Timaeus* 28c, 30b etc., Aeschylus: *Prometheus Vinctus*: 275, 456 etc.; Placita Philosophorum: 2:1,7.

[25] Liddell and Scott cites only one instance, i.e. in Idomeneus Historicus: Eu:415.

the other, they wanted to reserve the singular for Him Who Truly Is ὁ ὄντως ὤν.

The relation between τὰ πάντα the diverse universe, and ὁ ὄντως ὤν, He Who Truly Is, in patristic writing seems much more sophisticated and defensible than many/humanity-nature relationship. Dealing only with these two categories alone does not stand up to profound philosophical testing. Plato had already used ὁ ὄντως ὤν for true existence[26] as contrasted with the passing, changing, shadowy being of the particular existents. Athenagoras of Athens, one of the early Christian apologists, had referred to God as "that which truly is" τὸ ὄντως ὄν (neuter), as single in nature (*monophyses*) and as pouring forth the good from it, as the very truth.[27] Clement of Alexandria (215 + before) also frequently used this expression for the being of God to denote that He alone has a true and fully dependable being. This coincides with the Hebrew tradition's insistence on God as "He Who is and Who will be what He wills to be."

In contrast with this concept stands τὰ πάντα, the changing being of all that has been created. It is this great insight, and not the "desacralizing of nature," which stands at the heart of the Judaeo-Christian tradition. God's being is *sui generis*; it is without beginning and without end, it is neither spatial nor temporal. In other words, it is exactly the opposite of created being, which had a beginning and which must end; which exists in space and moves from beginning to end in time. Created being is inseparable from change; it is now subject to evil and therefore will inevitably disintegrate and die. Created being which has overcome evil must continue to change, moving towards that perfect good which is the being of the Creation.

[26] *Phaedrus* 247 c, e. Plato speaks here of the true being which is without colour, form or palpability. Republic 597d:1-3 is also about the only true being of God.

[27] Athenagoras, *Legation Pro Christianis* 23, PG 6:944B.

Since we cannot undertake an exhaustive study of the relation between God and creation - one of the central insights of the Judaeo-Christian tradition - we shall centre our study on one writer, St. Gregory of Nyssa, making some reference to others. But first we must briefly look at the western tradition.

In conclusion, certain preliminary observations can be made on the basis of the foregoing:

a. The concept of nature as the non-human part of the universe is primarily Indo-Hellenic in origin and becomes particularly prominent in an alienated society, i.e., one which has lost its direct sense of dependence on and derivation from God.

b. If the reaction against the evils of a technocratic civilization leads merely to a romantic reaffirmation of and reunion with nature, it cannot be salutary, for even the classical Western Christian tradition insists on the centrality of the third element - God.

c. In the Judaeo-Christian tradition, there was no such process as a desacralization of nature, because in it not only was the concept of nature as sub-human creation unknown, but also nature was never "divine," since it was not God, but only a created reality.

CHAPTER 9

An Eastern Orthodox Perspective of Nature, Man and God

Nature is a concept of Indo-hellenic origin which the authentic Christian tradition finds problematic. If it refers to "all things" (*ta panta*) constituting a system, a unity with a particular structure and order, then man is essentially, a part of that system; if it is interpreted in a non-inclusive way, it would have to be qualified as "sub-human nature" or "non-human nature" or "nature minus humankind."

If the assumption is that nature is something which exists by itself (naturally); as distinct from human culture, the authentic Christian tradition must again object. The creation is not self-generating or non-contingent. It does not have *autousia* or self-existence. Only the creator has such *autousia.*

To put it rather provocatively, nature does not exist; only the creation exists. Nature is a false concept, bound to mislead. The sooner we abandon it, the less exposed we will be to erroneous thinking.

The creation - *ktisis* - includes humanity. To talk of the creation minus man is absurd. We do not speak of man's relation to the creation, as if they were two separate realities. The most we can do is to speak of man's place in creation, and his relation to the rest of it in terms of that place.

The creation, in eastern orthodox thinking, is a dynamic entity, not a work that was completed in six days, as the Genesis account of it is sometimes interpreted. It is a process for which the *arche* or source is the creative *energeia* of God. Its destiny or *telos* is also given in the creative act of the divine *energeia.* That same *energeia* provides the dynamic necessary for it to move from *arche* to *fulfilment.* Thus the creation has no self-existence. The *energeia* of God is its source, goal and dynamic.

How is creation to be understood, and what is the role of man in it? In answering these two questions, this paper resorts to a certain amount of necessary speculation, based on the patristic heritage which shaped the classical Christian tradition. It relies heavily on Gregory of Nyssa (ca.331-389 AD), the only philosophical theologian of the undivided Christian Church who has dealt with these themes in any profound way and who is acceptable to the authentic tradition (Origen is not accepted; Augustine of Hippo and Maximus the Confessor are rejected by my particular tradition).

1. The Sources, Norms and Limits of Christian Understanding - Some Methodological Considerations.

a. *Epinoia or the Power of Conception and Creativity*

Human-beings are endowed with the capacity to conceptualise and to create. Gregory of Nyssa calls this capacity *epinoia.* Sense-impressions are the raw material through which the human mind informs itself. The nature of the mind enables, structures and limits the information intake. It is the faculty of *epinoia* which makes understanding possible, which enables man to imagine and to create the marvels of music and the arts, of architecture and technology. Man's relation to his environment is shaped by this ability to understand and to engineer.

Theoretical understanding, however, cannot be divorced from action. The head and the hands have to be co-ordinated, and language serves that co-ordination. Gregory of Nyssa regards the three elements - head, tongue, and hands -

understanding, language, and action - as essential to man's proper relationship to his environment. *Epinoia*, or the power of conception and creativity, has to do with all three, as well as with their co-ordination.

b. *Evil, Sin and Error*

The *epinoia*, however, is not free from error. It is capable of creating chimeras, of conceiving things which do not and cannot exist. The root of the error is in sin. Because of sin man is no longer in the state in which he was created. By a primordial act of evil, the human mind became incapable of knowing the truth. The possibility of error lurks behind every conception of truth. The world as we experience it is also shaped by this admixuture of error in the *epinoia*, itself caused by the admixture of evil in the human being which was created as good, but is now capable of evil as well as good.

True understanding, therefore demands release from this admixture of evil. Only as the human person is progressively liberated from the evil does his *epinoia* begin to function as it should. All three - understanding, language and action - are affected by the admixture of evil. Only through the transformation of his being can the human person arrive at error-free understanding, language and action. This transformation is ultimately effected through the process of death and resurrection, but that process can begin already here, through participation in the death and resurrection of Christ, through life in the community of the spirit.

c. *Life in the Community of the Spirit - Participation in the Living Tradition of Christ*

The community of the Church has its own understanding, language and action, which always transcends the rational. No final conceptual apprehension of reality is available to the community or to any of its participants. The best mode of apprehension and expression is the eucharistic act. All dualities are transcended in this act of union between the creator and the creation, through participation in Jesus Christ the incarnate.

Time and space are also transcended in this act, where eternity breaks into time and transforms it; where union is achieved with "all the saints" in space and time; where matter is the bearer of the spirit, the Bread of life; where God, man and the creation are united in one act of mutual self-giving, where the creation is offered up to God in self-offering and where God offers himself to the creation through the body and the blood; where the world is transfigured to bear witness to the glory of God; where the subject-object dichotomy is overcome in the act where the offering, the offerer and the one to whom the offering is made are united in love; where reason and the language of reason merge into the act of love; where memory and hope bring the past and the future together into the single moment of present eternity ....

This kind of theological language baffles and at times infuriates the scientific observer, for it refuses to be bound by the canons of ordinary speech. But both rite and symbol transcend ordinary speech. What follows is an attempt to translate into prose some insights about the nature of the creation characteristic of this strange community of the spirit.

2. The Creation : Contingent, Extended, Dynamic

a. *The Nature of Matter*

Gregory of Nyssa, made it very clear that matter as such is an abstraction which we never encounter. What we see is matter with qualities, the elements with their atomic structure. Gregory knew nothing of the sub-atomic world of particles; what he says about matter as abstraction applies at the macro-level of atomic molecular matter.

But Gregory, never made the mistake of saying that the universe is composed of matter in motion. Nor did he regard matter as an inert vehicle for its qualities. In fact, he insisted that minus qualities, matter is nothing, that it has no existence apart from the qualities. Different forms of matter are but different confluences of qualities.

He went one step further insisting that matter is nothing but energy - God's creative energy, moving dynamically from one form to another. The basis of matter is energy, the coming together of God's will that it exists and God's word which brings it into existence. Thus God's will-and-word, which is the *energeia* of God, is the basis of matter. Matter is the manifestation of God's *energeia*, contingent upon his will-and-word, dynamic and changing.

Today, with our knowledge of the sub-atomic world, we can go further. We can confirm Gregory's insight that the sub-atomic particles which constitute matter are a dynamic network of energy events continuously changing, forming, dissolving, re-forming. There are no "basic building-blocks," no solid entities occupying an absolute space. Energy and mass are interchangeable in an orderly way ($E = mc^2$). We cannot explain "nature" in terms of "elementary particles" and their primary qualities. The mechanistic picture of the universe, popularised by 17th century science belongs to the museum of antiquity. Matter-in-motion is no longer an adequate or tenable explanation of the nature of the universe.

b. *The Unity and Inter-relatedness of the Universe*

Most of our rational thought relies too heavily on the division of the universe into classes and species, into epochs and ages, into centuries and events, into separate objects and separate happenings. We find this division helpful and necessary. But usefulness is no guarantee of truth; the pragmatic criterion so central to modern science is at best a questionable test of truth.

What we have, more clearly in the sub-atomic world and less obviously in the macro world, is an interaction between the observing system and the observed system - not absolute knowledge of an independent object. In relation to the subatomic world, however, the observing system (that is ourselves with our experimental apparatus) is always understood in terms of classical physics, while the observed

system has to be understood at the level of quantum and relativity theories which do not fit into classical physics. It is only in terms of the latter that the observer-observed dichotomy can be maintaned. At the sub-atomic level, the observed and the observer are united in one interlocking system.

In an area where his technical knowledge is severely limited, the theologian must resort to the authority of the scientist. A recent article by David Bohm puts it this way:

"One is led to a new notion of unbroken wholeness which denies the classical idea of analyzability of the world into separately and independently existing parts .... We have reserved the usual classical notion that the independent reality, and that the various systems are merely particular contingent forms and arrangements of these parts. Rather, we say that inseparable quantum inter-connectedness of the whole universe is the fundamental reality, and that relatively independently behaving parts are merely particular and contingent forms within this whole."[1]

What we regard as solid, stable, material objects with their apparently objective existence, dissolve, at the subatomic level, into waves of probabilities, which are primarily patterns of inter-connections. We cannot observe nature as an object. If Heisenberg is right, "what we observe is not nature itself, but nature exposed to our method of questioning."[2] When our experimental arrangement is modified, the data yielded are also different. The observer thus becomes participator in the reality which he is measuring, and he can never know how that reality appears apart from his own participation of someone else.

[1] D. Bohm and B. Hiley, "On the Intuitive Understanding of Non-locality as Implied by Quantum Theory", in *Foundations of Physics*, Vol.5 (1975)

[2] Werner Heisenberg, *Physics and Philosophy* (London, 1963), p.57

The idea of an "objective world" independent of man has thus to be abandoned; there are no two realities called "man" and "nature" which can somehow be separately observed.

Nor can we any longer hold space and time as separate realities space-time, matter-energy, particle-wave, rest-motion - all these dualisms of classical physics also disintegrate at the sub-atomic level. Judging from literature on the subject, even the concepts of existence and non-existence seem to be problematic. Robert Oppenheimer is right when he says:

> "If we ask, for instance, whether the position of the electron remains the same, we must say "no", if we ask whether the electron's position changes with time, we must say 'no', if we ask whether it is in motion, we must say 'no.'"[3]

If he is right, then it is no longer right to say that everything is in perpetual change. Opposites polar like permanence and change, existence and non-existence, seem to co-exist, and even the most dialectical ordinary language fails to do justice to the complex inter-locking web that is our universe. The time-honoured principles of non-contradiction and the excluded middle fade into insignificance as being of use in only a very limited area of discourse.

What emerges is one universe, man inextricably interlocked within that system. It is this notion of the creation as one inter-related web, of space and time as merely aspects of it and not any kind of medium or vessel in which realities exist, which is affirmed by the authentic Christian tradition (*which some wrongly insist on calling the eastern Orthodox tradition*). The whole creation is a single unit, with space and time as merely cognates within it. According to this authentic tradition, it is absurd to ask questions about "the time before creation," for time begins with creation. Since the beginning of creation is also the beginning of time, there is no before that beginning.

[3] J.R.Oppenheimer, Science and the Common Understanding (London: Oxford University Press, 1954) pp.42-43.

Modern Physics puts a couple of questions to the classical Christian tradition. They relate to change and extension. Gregory of Nyssa would insist, for example, that change and extension are the essential characteristics of the created order, that everything in space-time is exended or distended, and that everything is continuously changing. The notions of change and extension can no longer be held in this absolute manner in the sub-atomic world, though even the micro*entities called particle-waves have their own probabilities of location and momentum. This simply means that the notions of extension (*diastema*) and change (*trope*) in the classical Christian understanding of creation have to be suitably modified, in order to accommodate the new insights of nuclear physics (relativity and quantum theories).

But the unity and inter-relatedness of the cosmos as affirmed in the classical Christian tradition is confirmed by the revolutionary new hypotheses of relativity and quantum physics. Man is inseparable from that unity. There is no nature as "creation minus man." We will deal with the place of man in creation in the next section.

c. *The Nature of Time*

While it is true, that modern physics does not permit the notion of time as a separate entity in which events occur, but sees it merely as a dimension of reality, the fact remains that we human beings experience time as death in another way. Every moment is born dead, for by the time we are able to say "now", the "now" has gone and become the "then" of the past. The moment called the present is, from our perspective, a fleeting point of intersection between two streams, the stream of the future passing over into that of the past. We can hold on to the past by "memory" and the future by "hope," as Gregory of Nyssa, has said. But there is no way to hold on to the present. It fleets. As Augustine said, it sweeps us away and offers us no foothold to save ourselves from its flow.

Time is death for matter, too. If Carnot's Second Law of Thermodynamics still holds, then everything - the whole cosmos - is in the process of giving off energy and moving towards the stable equilibrium called death. "When a closed system containing a large number of molecules is left to itself, it assumes a state of maximum entropy: that is it becomes progressively less ordered."

But life defies death, at least for a while. It creates ever more ordered system, culminating in the evolution of the human brain, the most centred and complex system of organization of molecules that we know. It has been achieved through death and reproduction, through the process of a bio-cultural evolution that has been going on for at least 10,000 years of known cultural history.

Time is the arena, where this struggle between death and life goes on continuously. Death disintegrates, life organizes. But life here, in our time, is always ultimately subject to death.

The Christian understanding of creation insists that this state of affairs is not final, that death came late into the cosmos, on the trail of that other enemy, sin. The present creation, or the creation as we presently experience it, subject to time-as-death, good-being always mixed with evil-non-being which drags it into the jaws of death, is to be liberated from both evil and death. This is a basic affirmation of the authentic Christian tradition. "Nature," red in tooth and claw, is not the last word. Sin is not the last word. Neither is death, nor Carnot's second law.

Life has triumphed over death, good over evil, being over non-being, in the death and resurrection of Jesus Christ. Therefore, we affirm our hope in a new heaven and a new earth, where time itself is transformed into an aeon where there is neither death, nor, consequently, birth or marriage. But we acknowledge that as Christians, we do not know how this will come about. The nature of creation as we now experience it is

intimately bound up with our experience of death, but in our Christian understanding of relation, we do not take the "given" as somehow final. We do not settle into this deathbound, sin-infested "natural order" as if it were the final reality. Nor can we regard knowledge, both theoretical and operational, of that present natural order as somehow the noblest of pursuits. Science and technology, which relate primarily to the knowledge of this decaying order of the present world, have their value in terms of making even this sin-infested world show forth the glory of God. But our hope negates this world which science studies, for we wait for a new heaven and a new earth where righteousness dwells, from which evil and death have been banished.

Not that the new heaven and the new earth are totally discontinuous with the present ones but whatever meaning the present world has comes from that element of continuity with the coming world. Here, we Christians differ from the Hindu-Vedantin who denies any significance whatsoever to the present time-world. For us, its significance derives from the significance it will have in the new.

3. Man's Place in the Universe

This transcended value of the present universe, in terms of its relation to the coming one is a value which man is responsible for maintaining. Where that value is denied, as it was in the post-17th century atmosphere of secularisation, what results is a lack of respect for the creation. As Richard Schlegel puts it:

> "With no transcendent value postulated for nature, men were free to act on a philosophy of exploitation of the apparent great machine within which they lived. The same cosmology that allowed this license also gave, thanks to the validity of the Newtonian Physics, a powerful weapon for constructing devices for the control of nature. Further, although man was of the world, he also stood apart from the scheme; for his intellectual and spiritual life were not to be related to the inanimate mechanisms of the natural world generally ..... Man's own welfare, therefore, as conceived in the light of his wants and

> powers, could in good conscience be furthered by any desired use of nature. It was an ultimate sadness that man was a puny and probably transitory phenomenon, without meaning in the great surrounding universe; but, also, he could display his ascendancy on earth, and, with a bit of good fortune, perhaps enjoy at least the major part of his life."[4]

What was necessary for the development of modern science was not so much of the Christian matrix as the denial of it in post-17th century secularisation in Europe. It was only by denying the transcendent significance of the present universe, and by isolating himself from it, so that value attached only to himself and his desire, that man was able to brace himself for the thoughtless exploration and exploitation of that universe. Man's making the universe as an object was the consequence of a double transformation in the European mind - the denial of any transcendent significance to the universe, thereby making himself the subject and the universe the object.

The authentic Christian tradition calls in question both attitudes. The universe, though subject to death, has relation to the new heaven and the new earth, and so has transcendent significance; man is an integral part of that univese, and cannot stand outside of it, making himself the subject and it the object. The universe is not an object, nor is it made up of particular and independent objects. Man is not merely a resident in the universe, surrounded by different objects which he is free to manipulate. He is an inextricable part of that universe, and has emerged from within it.

The Christian tradition, holds on to three fundamental lines of thought about man's place in the universe.

a. *The Concept of Adam.* Adam means that which came out of *Adama*, the earth. His body has the same components as the earth. In fact, all living beings have bodies composed

[4] H.R. Schelegel, "Quantum Physics and Human Purpose," in *Zygon* (8), December 1973, pp. 200 ff.

of the same elements as found in the earth. Man shares this aspect of his being with animals, plants and inorganic matter. "The first man is of the earth - earthy", as St. Paul put it.

b. *Man as the Crown of Creation.* The tradition accepted an elementary form of the doctrine of evolution, thirteen centuries before Charles Darwin. Gregory of Nyssa, in the 4th century, held the view that the same force of creation, operating in inorganic matter, shaped the plant world or vegetative sphere of life, the animal world or the bio-sphere, and the human world. He went further to say that the human body incorporates all the lower worlds - the animal and the vegetative elements exist and operate in the human. While Gregory rejected the man-as-microcosm idea, he held that man in a sense recapitulates and represents the whole universe; that in man the cosmos consciously responds to the creator.[5]

c. *Man as Co-creator with God.* Man, as part of creation, is not an object for the cosmic forces to mould at their will. He is free. This means that he is not a passive subject, acted upon by the universe, but is capable of understanding and acting upon the universe. This is what the tradition means when it speaks about *apatheia* as freedom. *Patheia* or passion is, paradoxically, passive. It means being acted upon and carried away by forces. *Apatheia* is active. It is not *apathy*,

[5] "Scripture informs us that the deity proceeded by a sort of graduated and ordered advance to the creation of man. After the foundations of the universe were laid, as the history records, man did not appear on the earth at once, but the creation of the brutes preceeded him, and the plants preceeded them. Thereby scripture shows, that the forces of life blended with bodily nature according to a gradation; first it infused itself into insensate nature, and in continuation of this advanced into the sentiment world, and then ascended to intelligent and rational beings,"Gregory of Nyssa, *On the Soul and the Resurrection*, Nicene and post-Nicene Fathers, series Two, Vol. V: 441 B. Patrologia Graeca, Vol. 46:60A.

but a heroic refusal to be passive. If God is creator, and man is made in His image, has man also to be in some sense a creator? He expresses this creativity by shaping himself, his society and his environment. This is his freedom - limited, but real. Science and technology can be instruments in the exercise of this freedom: freedom which ensures in creating of the good, responding in eucharistic thanks giving to the creator.

Any understanding of "nature" must then take into account these three elements:

a. man's participation in "nature" as integral to it;
b. man's representation of "nature" as its priest, so to speak; and
c. man's transformation of 'nature' to conform it to the good.

4. God and the Universe

The relation between God and the universe cannot be grasped conceptually as long as one of the two terms - God - eludes the conceptual grasp. The tradition insists, however, that God is neither "beyond the universe", nor "contained in it". Not contained, for that which is contained would be finite; not beyond, for then there would be a boundary between God and the universe which would make both God and universe finite since bounded.

Gregory of Nyssa, holds the following principles regarding the God-universe relation:

a. The universe subsists on and participates in God's *energeia*, but its "is-ness" is not of the same order as God's "is-ness", and therefore the relationship cannot be defined in terms of any relationship of two entities with our kind of being.
b. From our side, there is a *diastema* or gap between the universe and God, but from God's side there is none. The gap is experienced by us in many ways. One of these is that the rational understanding can travel through the

sequential chain of the inter-connected cosmos, but never to the "is-ness" of the One on whom it is contingent. Rational knowledge does not get outside the created universe.

c. The question about God's existence is meaningless, since every created "is-ness" is contingent upon the uncreated "is-ness" of God. Nothing is except in contingent relation to God's "is-ness."
d. Even the question whether God and the world are two realities is pointless. This does not mean that God is the same as the universe. But it does mean that God is not "outside" or "beyond" the universe, which would logically mean that the universe is outside God, which means that God has a boundary with an inside and outside. If God and world were two realities, then God plus world would be more than God. There cannot be anything like God plus something else. Hence, we must abandon the notion that God and world are two realities.

Practical Implications

1. "Nature" terminology is misleading, since it separates man from the rest of the universe, attributing transcendent value only to man and not to the universe. This terminology is better abandoned. "Creation" is a Christian word. If a secular word is needed, it is best to use "universe."
2. Man does not exist apart from the universe, nor does the universe as known by science exist apart from man. Humanity and the universe are interlocked parts of a single system. That system cannot be made into an object without distortion. It is like humanity's body, not like an object outside humanity.
3. Man deals with this universe not in one way, but in several. Science-technology offers one way, but it is by no means exhaustive. Three ways can be envisaged like;

a. dealing with it to create the good through understanding and manipulation, but without idolizing it or being totally absorbed by it.

b. caring for it as one cares for the body, or as a priest cares for his people, and developing it; and

c. dealing with it through symbol and ritual to transcend it and to relate oneself to the mystery of the creator whose energy constitutes it.

4. These three ways are complementary and not exclusive of each other. All three are necessary. Only a combination of the three can make us fully human. Even the Antonine monks in the Egyptian desert knew it. They combined working with their hands, usually, weaving baskets, caring for the animals, and sacramental worship. Human culture must also provide for all three approaches to "nature."

CHAPTER 10

The Captivity of Science

Science as Exploiter and Science for War

The era and culture, which have brought Asian civilisation under western intellectual and spiritual domination have modern science/technology as their most powerful instrument being used today in the world that can illuminate the nature of Asian captivity and show us the way to emancipation. We shall look at the relation between science and militarism but before that let us see how the scientific/technological enterprise in the world is a captive of the unjust economic structure of market economy imperialism.

A. Science, Society and Liberation

Modern science has become a 'Sacred Law', perhaps more so for Asian intellectuals than for the westerners who lived with it much longer. To question science and its ultimate authority is to risk one's standing in the academic community.

The west began to question the hegemony of science, only after technology provided affluence for the majority. We in Asia, (especially, outside Japan), an Asia where affluence for the majority is still only a pious dream, have to look to modern science/technology to make that dream come true for us.

We have in India, a project sponsored by the U.N. University on "Alternative Science." Ashis Nandy is one of the leading spokesmen today, of the possibility of another kind of science than western science. He gives us examples of "ethno-science" the Navaho plant classifications and Indian bio-feed-back oriented yoga systems; Acupuncture would clearly be an alternate science, which is now accepted by modern science. Ashis Nandy argues that western science is today a captive of the establishment, determined to be used for exploitation and cultural destructiveness, and that Asia should develop an alternative science, without the aggressive-exploitative character of western science.

This captivity of science is three-fold : to the corporations, to the military establishment, and to a decadent culture unable to provide orientation for science.

Science/technology has today, become a large vested interest captured by the military-industrial-banking complex that runs the market economy of the world. And that captivity has been able to force a major part of socialist science also to become captive of the military establishment.

Pure science, such as produced in the Theory of Relativity and Quantum Mechanics, is a rarity these days. Not even 5% of the total investment in science is dedicated towards disinterested investigation of reality. More than 95% of it is geared to profit and war. Half a million scientists all over the word are today engaged in military research i.e., in finding out more effective ways of destroying others and ourselves. One-third of all scientific research is controlled and financed by the military, and one half by corporations, almost all the leading universities of the developed world look to the military or the corporations for funding their scientific research projects.

The corporations control at least half of the total scientific research in the developed market economy countries. They know where the market is : in food, health, security, clothing,

shelter, communications, energy, know-how, transport and entertainment. These are all necessary for the human being, and scientific research alone can help the world to feed itself properly, to be in good health, to have peace, to be decently clothed, to live under a proper roof, to communicate with each other, to use leisure creatively and to have the energy and knowledge to do all this effectively. These are the basic needs, and science/technology would be geared in meeting these basic needs.

The tragedy is that interest of the military-industrial-banking complex MIB is not meeting these basic needs of all the people, but rather profit and power for the few. The MIB Complex, will use human basic needs to exploit and enslave the people in need.

I wish, I had time to speak to you in detail about the problems of " seed patenting" by which the companies seek to make all food production dependent on them. Agriculture is being fast industrialized, and one consequence in market economy countries is the domination of the agricultural sector also by the MIB. They can control the price of seeds, fertilizer and agricultural technology. The same is true of the medical facilities which have already been priced well beyond the capacity of the ordinary person, even in developed market economies.

Science has to be delivered from its captivity to the MIB, if it is to serve the interests of humanity. At the moment, there is no alternative financier who can under-write scientific research in the non-socialist world, since the state itself is a function of the MIB.

Science-technology has become the major instrument of exploitation in the non-capitalist world. This was brought out clearly by a UNESCO study, undertaken in 1975. They made a study of Research and Development in Science/Technology in 150 countries (nearly all except China) based on 1974

statistics. The results are shocking. Global expenditure on research and development was US $ 101,785 million - say 102 billion dollars. Of this amount, 2.6 per cent was spent in the developing countries and 97.4% in the developed countries-both market economy and centrally planned.

There were 2,978,204 scientists and engineers with post-graduate degrees, engaged in research and development in the world. Of these nearly 3 million researchers, only 6.1% was in the developing countries, and 93.9% in the developed countries.

Those who finance science/technology research also control it. In ten years, the money spent on R & D has already trebled. But the industrially less developed countries, with two-thirds of the world's population do not even manage to keep up with their 2.6% of the total. The big U.N. Conference on Science and Technology for Development (Vienna, 1979), spent 18 days and 25 million dollars discussing this problem. Most of the time was spent on empty speeches. The negotiation behind the scenes was between two groups - the more than 100 developing countries as a block, and the developed market economy countries as another block, with the socialist countries nearly neutral, though sympathising with the non-aligned. They agreed that a fund should be created to help the developing countries with the research in science and technology. They disagreed on how much money the fund should have. The developing countries demanded a two billion dollar fund for a period of 10 years. The developed countries proposed 200 million, but subject to approval by their governments. The final compromise was $ 250 million for a period of ten years, but without any commitment. That is about $ 25 million a year. And the gap in 1974 was $ 96,500 millions. Today, it is more than $ 200 billion.

So in our present society as science and technology develop further, the developed economies will have greater power to enslave and exploit the developing economies. That is why

there is no emancipation from Asian captivity, unless we liberate science and technology from the grip of the MIB.

This is the aspect of our captivity to which Ashis Nandy makes but scant reference. Neither does Fritjof Capra or other western writers dwell on this at length. Capra in his "Turning Point" (sub-title: Science, Society and the Rising Culture, 1982 Fontana paperback, 1983) speaks about the need for a paradigm change in science as a whole and its perception of reality. His argument is that the present overall mechanical paradigm leads to major distortions in our understanding of reality. Now we need a paradigm, that does justice not only to quantum theory and relativity theory, but also to the emerging and dynamic or flowing perception of reality. That will lead to a global cultural transformation, according to Capra. This it will, indeed.

But Capra, does not recognize the main problem as the enormous pattern of international political-economic injustice within which science develops. He refers to the third world objections to importing the science and technology and related problems of the West (p.463). But his insensitivity to the gruesomeness of international economic injustice, makes his analysis less useful to Asians. Asians have a double task: to liberate science/technology from unjust economic structures, and to develop an alternative science.

B. War Worries

Two problems have clearly emerged in the area of war and the arms race, which should be of central interest to Asians in their struggle for emancipation: (a) the Reagan Administration's Strategic Defence Initiative (SDI or Star Wars), and (b) the new scientific consensus on the ecological consequences of even a limited nuclear war (Nuclear Winter).

The foundation of SDI, and the coming into power of Ronald Reagan, took place around the same time - in 1981.

General Daniel Graham (retired) and the near fascist scientist Edward Teller, with the Rand Corporation, a major enemy of humanity, were the main architects. The idea had been shaped before Reagan came to power - the idea of the "High Frontier," but the monograph with that title became available around the time of Reagan's access to the most powerful seat in the world.

The idea is simple - a Maginot Line in space which the enemy cannot break through - the "inviolable" high frontier of an "absolutely reliable" space-based anti-missile defence system.

It was only in March 1983, two years after accession that Reagan made his "star wars" speech on SDI. Many Americans were thrilled by it. It was written in the best rhetorical language and delivered with impeccable histrionic training.

The speech-writers knew the psychology of the American people especially of the naive and unsophisticated among them. The American people do not like nuclear weapons, especially if they are too close to them. So the speech thundered, "destroy space! keep the earth, especially our land, free from all nuclear war." The rhetoric sugar-coated the war mongering as longing for peace - the peaceful "space shield" that will protect American civilization. No more MAD - Mutually Assured Destruction but AUSS - Assured U.S. Survival.

So went the rhetoric of that star wars speech. Only later somebody suggested that the U should be dropped from AUSS. What are the arguments for SDI? They are mainly three - (a) it is clean, and keeps the earth free from nuclear war; (b) it is defence, not offence, and (c) it is to be welcomed, because it renders nuclear weapons obsolete. What are the facts?

a. The strategy is not reliable, first because it is powerless against cruise and other missiles which travel through the earth's atmosphere and can deliver nuclear warheads from sub-marines and planes.

b. The strategy is not reliable, for even if the launch is entirely through space, the defence strategy cannot be effective - since maximum effectiveness which can be technologically achieved is about 90%. Even if the system is 95% efficient, in case of a massive 1000 missile attack, the 50 missiles that will certainly get through the barrier are sufficient to destroy a country and destabilize the world's ecology and life system.

c. The strategy destabilizes the world also by giving one nation military superiority over others, and making others totally at the mercy of one nation. This fascism cannot be allowed.

d. If the U.S. resorts to a space-based military system, the USSR is not going to sit idle. In fact, they are not sitting idle. They have already developed cruise missiles which can escape the space shield. They will develop offensive weapons which can destroy the space shield. The vaunted security shield will not last long and will soon become an obsolete white elephant hanging over our heads in space.

e. A space war would not be so clean. Even if missiles are destroyed in lower space, damage to the zone shield, and radiational and climatic hazards to humans can be immense and intolerable.

f. SDI is forbiddingly expensive - even for the USA. In 1985-89, $27 billion has been allotted for a research programme for developing a space-based defence system. If two billions of that amount could be set apart for humanely useful scientific/technological research in two-third world countries, this could substantially help alleviate poverty and ill health in the world.

Building the system would cost at least $ 500 billion. The US is now heaving in debt and lower income groups are suffering. Spending 500 billion dollars on SDI means more profit for the corporations at the tax-payer's expense, rendering the common

man poorer. MAD is being replaced by clay-headed, racist, abnormal, zany yankeeism or CRAZY. It will drive the world crazy. Humanity cannot permit such fascist madness, it is assuredly self-destructive for all humanity.

We are well into the space-based war system now. On January 25th 1984, Reagan announced plans to build a permanent orbital station - Columbus, costing 8 billion dollars, the first constituent elements to be assembled in space by 1992. It will be a command and communication centre as well as a space-weapon assembly plant. There is the idea that space-based industry can also be developed there.

The Russians have already followed suit. They are also working on a space station. In February, 1985, President Mitterand of France called for a manned military orbital station for west Europeans. If other countries would not co-operate, France would do it alone.

CHAPTER 11

Scientific Temper

Time for a Resume before the Debate Resumes

Why don't people give credit where it is due. If Ashis Nandy had not hit back in horrid overstatement at the Scientist's Manifesto (Statement on Scientific Temper), who besides a few connoisseurs, would have paid any attention to it?

The debate has now gone on for full six months, a resume of the discussion so far is overdue before we go much farther. Let us start with Prof. K.V. Subbaram (Mainstream, January 16, 1982), who stated that Ashis Nandy obviously missed the main point of the Statement on Scientific Temper (SST). This seems to be true. The statement was directed against a phenomenon that frightens many thinking people - the growth of irrationality or retreat from reason, manifested in the recrudescence and popularity of religious practices (superstitions and bizarre rituals) incompatible with a rational world-view. And the consequence is that with the world's third largest trained man-power in science and technology, we are unable to solve the basic problems of the Indian people - mainly poverty, inequality, ignorance, ill-health, and general backwardness, with a tendency to glorify the past by creating

a false one. The authors and signatories of SST argue that all of us, not just scientists, but including teachers and media people, should undertake a rational scientific analysis of the social barriers that have to be broken in order to move ahead.

If that is the main thesis of the SST, then Ashis Nandy's powerful invective has hardly scratched its surface. Nor does the efforts of Baudhayan Chattopadhyaya and Rajendra Prasad to castigate the SST and the counter statement on humanistic temper on purely ideological grounds carry much conviction.

Apart from the intemperate language Ashis Nandy makes two points:

a. human dignity and welfare are more important than the scientific temper in itself;

b. any evaluation of the scientific temper must depend on the criterion of how it contributes to human dignity and welfare.

I do not see, how the authors of the SST can quarrel with that either.

Of course, the SST does not say that the scientific temper will solve all human problems and will promote human dignity and welfare. But it does take into view that it is the prevalence of superstition, bizarre ritual and obscurantist social customs in an atmosphere of conformity, credulity and unquestioning obedience to authority, that constitute the main obstacle to the advancement of the scientific temper. The statement makes a case for such a view by arguing that "obscurantism and irrationalism practised by a hierarchy of authorities has the predictable effect of reinforcing retreat from reason." And so it places us before a choice: "We either overcome the obstacle or we shall be overcome by unreason and dark reaction."

Are those the real alternatives? The SST has not convincingly shown that the absence of or retreat from rationality is our main problem, endangering our very survival.

It simply presupposes that position. And here, it seems, is where the issue has to be joined. Ashis Nandy argues:

a. that science itself is not as objective or rational an exercise as it may first appear;

b. that science does not in fact exist in a pure state, but only as an aspect of a society's approach to life and as a historical development; and

c. that in the world today, the scientific enterprise has become a major instrument of oppression and the victims have a legitimate right to resist its triumphalistic onslaught.

Positions (a) and (b) have to be conceded without much argument. On point (c), however, the issues have to be more carefully formulated. Let us try to put down some affirmations which can then be argued out if necessary:

a. One cannot compare "pure" science and corrupt religion. The religious enterprise as well as the scientific enterprise has to be taken in the wholeness of its historical manifestation, and only afterwards can one separate pure religion or pure science.

b. There is no debate about the negative aspects of the religious record or about the positive aspects of the record of the scientific enterprise. What the SST fails to do is to make any reference to the positive achievements of religion or to the negative record of science.

c. The SST must concede to Ashis Nandy his charges about the complicity of science in the horror record of our own century (the century of science): i.e., Nazi concentration camps, Hiroshima, Nagasaki, Stalin's Siberian camps, Vietnam, Cambodia, and so on. Science and scientists are answerable for their complicity.

d. The authors of SST should answer the charge that science too can be authoritarian - it matters not that it is a corrupt

science that becomes so; for in religion too only corrupt religion leads to authoritarianism.

e. The authors of the SST must answer the claim that others have just as much right to criticise science, as science has the right to criticise non-scientific activities and pursuits.

f. They charge that science is today a prisoner to the military establishments which breed violence and destruction, to the military contractors bent on making a fast buck and to the transnational corporations which make profit and power their primary principles.

g. The most devastating charge is that the scientific temper can make human mind arid, one-dimensional, neglectful of the most cherished values of humankind.

The debate should continue and perhaps, The Nehru Centre New Delhi should organise a small meeting, where opposing points of view can struggle to emerge in an improved draft which then can be the basis for a national debate. To say this, is of course, to express one's high appreciation of both the original statement and of its criticism.

CHAPTER 12

The Religion of the Scientist

Some Questions to Science

Steven Weinberg's *The First Three Minutes*[1] does not claim to give the scientific view of the origin of the universe. The sub-title speaks only of "A Modern View of the Origin of the Universe."But Steven Weinberg, is a professional Harvard scientist of fairly high reputation, a particle physicist, not an astronomer, a regular contributor to the *Physical Review;* a researcher at the Smithsonian Astro-physical observatory.

It is not a scientific book; it is not written for the scientist; in fact, Weinberg states, precisely the type of reader he has in mind: "I have written for one who is willing to puzzle through some detailed arguments, but who is not at home in either mathematics or physics." It is thus meant for the intelligent general reader.

Aye! there is the rub. It is a scientist writing for the general public. If he were writing for the scientific community, he would not only be more technical, but also more rigorous. And he is trying to convince the intelligent reader, that science can now provide a supportable hypothesis about the origin of the

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[1] Basic Books, *Bantam Edition*, New York, 1979, p.178.

universe. Of course, that is all that science ever does provide - supportable hypotheses to test them.

An Isaac Asimov citation, on the front cover of my paperback edition, describes the book as "the first book to put the details of the origin of the universe within the grasp of the general reader". That gives the impression, at least to the general reader, that it is popular science that is being dished out. T.D. Lee, "Nobel Laureate in Physics," says on the back cover: "a most remarkable achievement..... presented with clarity and great scientific accuracy".

Besides, at the end of the book, there is an elaborate "mathematical supplement", which gives the impression of providing the scientific basis for the popular presentation.

The book deals with "the early universe - and in particular with the new understanding of the early universe that has grown out of the discovery of cosmic micro-wave radiation background, in 1965."

Now, what the general reader often gets from such a book, is the vague belief that science or scientists can now explain how the universe came to be, and as a corollary, that religions are generally and often absurdly mistaken in their views on the subject.

The "scientific view" thus, is that at the first 1/100 of a second after the "big bang," the universe had a temperature of 10^{11} (1 followed by eleven zeroes) degrees centigrade, temperature at which no gas or liquid or solid can exist - only "elementary particles" - mainly electrons and positrons, in about equal numbers - with some neutrinos and photons, both of zero mass and zero electrical charge, being continually created and dying out after a brief life. There was some "contamination" of heavier particles - protons and neutrons - at the rate of 1 heavy particle to 1 billion light particles. Then there is the cooling and the condensation of matter and all that - as in the "standard model."

But what about 1/100 second before the cosmic soup at 10^{11} degree centigrade began to cool? Well, Weinberg promises something in the introduction: "We will also try to look a little way into an era that is still clothed in mystery - the first hundredth of a second, and what went before." Well, science does seem to know practically everything, just may be a little bit more to be found out, otherwise we are already there - at omniscience through science, aren't we?

There was a universe of "infinite energy density" and "infinite temperature" before it banged - composed of quarks and antiquarks, leptons and antileptons, and of course photons, "all moving essentially as free particles." Each particle, whether heavy or light had its own black-body radiation. This was the situation the first 1/100 second of creation (assuming of course that the quark theory will find sufficient empirical evidence in the future) at one crucial temperature of 10^{11} degrees centigrade. But there has been a "phase change" just 1/100 seconds earlier. Just as H_2O obeys different laws in its three different phases i.e. steam (gas), water (liquid), ice(solid), the universe had a phase change, just as it cooled down from the critical minimum of say 3000 million million degrees (3×10^{15} degrees Kelvin). Previously everything was non-expanding and infinitely condensed - the whole universe probably being about the size of one of our present particles, or conversely, each particle about the same size as the present universe! (p. 136). But actually what we generally observe today depends a lot on the history of the universe before the "phase change." We cannot find out whether the pre-bang universe was isotopic and homogeneous, or any such detail. Says Weinberg:

"One possibility is that there never really was a state of infinite density. The present expansion of the universe may have begun at the end of a previous age of contraction, when the density of the universe had reached some very high but finite value" (p.138) and again:

"..... although we do not know that it is true, it is at least logically possible that there was a beginning, and that time itself has no meaning before that moment" (*ibid*).

Weinberg becomes modest at this point:

"We may get used to the idea of an absolute zero of temperature i.e., - 273.16°, when there is no temperature at all - a moment in the past beyond which it is in principle impossible to trace any chain of cause and effect. The question is open, and may always remain open" (p.139).

Now Weinberg comes to some conclusions at the end of his book, conclusions which sound strangely familiar to those of us acquainted with a large number of religious traditions - the *Pralaya* theory of the Hindus, just to cite one example. The *Upanishads* and the *Brahma-sutras* have so many references to this concept. In Sri Sankara's commentary on the *Brahmasutras*, the concept of *pralaya* (deluge) (I 1.2, II 1:1, 8, 10, II: 3:14, 15, 17, IV: 2:1, 15, 16) and related terms like *pralayakala* (the time of the deluge, II:2:12), *pralayakrama* (the order of the deluge, II 3.14), *pralayaprabhava* (the happening of the deluge, 1:3:30), *pralayaprabhava prasanga* (the declaration of the happening of the deluge II:2:14), *pralayaprabhava sravana* (the hearing of the happening of the deluge, I:3:30), *pralayaprasanga* (declaration of the deluge I:4:22), *pralayaprasiddyartha* the spread of the news about the deluge II:2:12), *pralayasamanya* (IV: 2:16, general deluge or deluge-like) occur many times.

Deluge is a poor translation of the word *pralaya*. The basic meaning seems to be dissolution (*laya*) into its original state by melting away. The classical Hindu conception is that the universe as we know, is a process of combining forces or qualities (*gunas*) which in their various combinations produce the changing reality of the time-world; we experience it in a particular way, because there are forces or qualities in the universe as well as in our own equipment (we being part of the universe now), which obscure the true nature of ourselves and the universe.

The sophisticated Hindu would say, that this "phase change" of reality which we are now experiencing in time and space (and with which science primarily deals), is not the true nature of either ourselves or of the universe we experience. The original reality, that which existed before the phase change, before the first 1/100 of a second, is our true nature, and to realise and experience this true nature of ourselves and the universe is the ultimate goal of humanity.

Weinberg says:

"Men and women are not content to comfort themselves with tales of gods and giants, or to confine their thoughts to the daily affairs of life; they also build telescopes and satellites and accelerators, and sit at their desks for endless hours working out the meaning of the data they gather. The efforts made to understand the universe is one of the very few things that lifts human life a little above the level of farce, and gives it some of the grace of tragedy" (p.144).

Now, to me who is not a scientist, that sounds more like a particular religious attitude than a scientific attitude. I respect this heroic, tragic, religious stance of the scientist who finds some meaning in his activity. But this is a particular religious attitude, and should not be confused with science. The religion of the scientist, if it is noble, should be respected as much as any other religion.

But the scientist himself, should be aware that this attitude does not as yet belong to the 'essence' of science.

Neither does the attitude of many scientists towards religion belong to science. Weinberg begins his book, by an account of the origin of the universe as explained in the *Younger Edda*, a 13th century compiled Norse or Icelandic myth. He feels very superior to the Norse mythical conception, in which he sees nothing that is not ridiculous. The implied assumption is that all religious views about such matters are equally absurd.

Here, my modest question to my scientist friends is why don't you recognize that myths are not science, that they don't speak the same language? Why demand that religious language should imitate scientific language? Is it not better to recognize that some scientifically "mistaken" religious conceptions of the universe have given better orientations for humanity relating itself to surrounding reality? Why don't scientists speak about some of the most ridiculous "scientific" conceptions of the 12th century at the same time as they lampoon a 13th century Norse myth? Why don't they make a deeper study of the religious perspectives like Einstein and Oppenheimer did, the study which probably helped them in forming more relevant scientific hypotheses?

In India, why don't scientists try to explain their understanding of the universe to a group of Hindu, Muslim, Buddhist, and Christian philosophers and listen to what they have to say? It may not turn out to be as futile as one may think, provided, of course, there is competence as astuteness and openness on both sides.

CHAPTER 13

Heritage Versus Technology

Refelections on the Role of Technology in Shaping the Indian Identity

No culture today, can escape the globally pervasive power of modern technology. Never before, in human history has appeared such a globally pervasive power - unless it was the global atmospheric change which finished off the dinosaurs many millennia ago. A culture seeking today to keep free from technology's impact in order to preserve its purity has as much chance as the dinosaurs had then.

The reasons for this pervasive power are not far to seek. Technology creates not only instant global communication, but also its own institutions and forces its own wants and commodities to meet those wants, its own social organisation and status symbols.

In 1985, the then Prime Minister of India, Sri Rajiv Gandhi, in his inaugural address at the Diamond Jubilee of the Indian Philosophical Congress at Hyderabad, raised the question for Indian philosophers to reflect upon: Is there any intrinsic contradiction between the new technological civilisation that India was determined to develop by the year 2000 on the one hand, and the values of India's traditional heritage on the other?

Before the philosophers could digest the question, Rajiv Gandhi proceeded to answer it from his own point of view. To him there was no such intrinsic contradiction. He pointed to Japan as a nation which had resolved the conflict between technological values and traditional Japanese values.

For those who know something of Japan, this was a judgment hard to swallow. Japan is still in the first stage of the conflict. The decision has been to give priority to the demands of technology and management as decisive for the economy. Culture can only be a secondary consideration, since the top priority is to beat America and Europe and become Number One as a nation. Once the technology and the economic resources are there, the claims of culture and identity can be left to a second stage.

The Japanese have known the problem, ever since the Meiji Restoration in 1867, when the westernising trend began in Japan under pressure from the western powers. For us, in India westernisation began much earlier, and under British colonial tutelage we learned to despise our own heritage in a way which the Japanese never did. And unlike the Japanese we were never at the stage where we could compete with the West in their own game of technology. The Japanese certainly show more cultural self-confidence than we in India seem capable of at present; but they too are far from having resolved the question of heritage and culture. We can learn from their experience, but they have given us no model.

Rajiv Gandhi's formula was quite simple: adopt the technological civilisation as base, and then weave into it certain values we can now pick and choose from our rich and varied heritage. He proposed two values he had found useful for himself from the Gita and the Upanishads - *nishkamakarma* (right action without desire for its fruits), and *stitaprajnata* (keeping your cool in the face of impending catastrophe), or in his words: "unflappability is the better part of valour." All right, perhaps for Rajiv Gandhi as an individual, a technologist

who had become head of the Indian state; but certainly dubious as a social value for our people harrassed by the impact of western technology. We need to go a bit deeper - to look at modern science-technology (Sci-tech) both as an enterprise and as a way of dealing with reality, and then see how these fit into the Indian identity.

Science-Technology as Enterprise and Commodity

The Inter-dependence of Science and Technology

There was a time, when it was fashionable to make a neat distinction between pure science as theoretical knowledge and technology as mere application or the applied science of engineering and technology. Pure science was conceived of as something existing in its own right, independent of whatever technology that may develop from it. The former was supposed to be distilled permanent truth, pure theory, objective and proved, while the latter was simply putting the former to work for human purposes. I myself, used to say once, science tells us how things work and technology shows us how to work on things by using the knowledge about how things work. I no longer do now, for three reasons.

Pure science (e.g., a new general theory of relativity or new attempts to formulate quantum theory beyond the Copenhagen interpretation) has now become rare, certainly less than 5% of the total scientific technological research being done today. Most research in science is geared to technological interests, whether that technology be medical, military, agricultural, industrial, communicational, cybernetic or others.

Secondly, scientific research today has to be corporate, since the costs and infrastructure involved are way beyond the means of the individual scientists. Gone are the days, when scientific research was a job to be accomplished by the individual scientist in his or her own private backroom laboratory. It is a huge enterprise, sometime even way beyond the means of individual governments. The new multi-million

underground Particle Accelerator, at the Centre Europeenne de Recherche Nucleaire near Geneva is seven kilometers long, partly under Switzerland and partly under France, financed jointly by 14 European governments. Research in laser technology or super-conductivity also has become forbiddingly expensive, even for many governments. And while, a case can be made to show that some of this has no immediate commercial application, the enormous quantity of funds needed would not have been forthcoming if the governments concerned had not some hope to be economically rewarded for their efforts.

The third thing to note is that scientific research has increasingly become dependent on high technology and the independence of science from technology is now mostly a myth. Even simple biological research requires electron microscopes and other high technology equipment. Technology is no longer merely an outcome of science. There can be very little science research today without advanced technology. The two, science and technology - are inextricably intertwined, and it is better to speak of them as one reality - "sci-tech."

The Sci-Tech Colossus

And this sci-tech, is today a multi-billion dollar colossal enterprise, financed and controlled largely by military establishments and large transnational corporations. The main funding source for sci-tech research is today the trillion-dollar global military budget, and the corporations and contractors who benefit from that inhuman and useless budget, paid for by the sweat and toil of the working people and costing the precious life of many young people in our mad world.

Armaments expenditure gives us no added security; it only creates greater insecurity. But it decisively influences the direction of scientific research; most of our present sci-tech research aims at means for more efficient murder and destruction. One consequence is the spread of militarism in all our societies promoting greater social violence than before. The

global sci-tech enterprise thus becomes the most powerful anti-human force in our societies, with its increasing subservience to war and profit. Why are we unable to develop counterforce capacity to combat this monster? Michael Raemer writing in the Worldwatch Institute's "State of the World" Report (1990), says:

"The major barriers (to conversion to a peaceful economy) are not technical but political, ranging from the power and agendas of vested interests, to the widespread misconception that military spending makes good economic sense. Military contractors have little incentive to move out of defence work: They enjoy low-risk operations, generous cost-plus contracts, and large profits. Conversion would mean a loss of power and privilege."

In addition to that, in many countries including India, defence contractors provide a good chunk of the annual as well as election-year expenditure of political parties, and reduction in defense expenditure would cut into these kickbacks; political parties not being based on the public's financial support can no longer be controlled by the public.

The myth that defense expenditure creates new jobs dies hard: in India it takes Rs. 2.5 lakhs to create one job in an Ordnance Factory; in ordinary civilian industry Rs. 70,000 can create a job; and in road construction or agricultural investment it takes only Rs. 1500 to Rs. 2000 to create a new job. It is the military-industrial system that stands in the way of solving the problem of India's colossal poverty. That league is today a colossus in India eclipsing the identity of the ordinary Indian. It is true that in India only about 3 percent of total industrial employment is in military establishments, compared to Israel's 22.6%, USA's 11.1% and China's 10%. But compared to Pakistan's 0.8% or Brazil's 0.7%, we are overmilitarised; besides the 3% figure does not include those employed in subsidiary undertakings serving and supplying the military.

Sci-tech and the TNCs

The progress of Sci-tech, in the rate of acceleration as well as in directions, depends heavily on investment in research and development. The government share in that investment is largely in the defense sector. Most of the other investment comes from the large corporations, both national and transnational. The main interest of these corporations is not in the public good, but in private profit and expansion of their own power. The world's R&D budget, today stands above 200 billion US dollars a year. How much of this is directed to solving the huge basic needs and problems of the poor and the marginalised? There are no clear estimates on this, as far as I know. One estimate gives the figures as follows:

Defence	24%	Basic Research	15%
Space	8%	Energy	8%
Health	7%	Agriculture	3%
Transport	5%	Pollution Control	5%
Information tech	5%	Others	20%

These figures are eminently misleading. Not only is there a large military component in space, information processing, energy, transportation and basic research but even the other sectors, like health, for example, are heavily oriented towards quick profit by targetting on the rich who can pay for expensive diagnosis and treatment. What is called agricultural research is mainly in ecologically counterproductive chemical fertilisers and pesticides, and in developing and patenting high yielding varieties of seeds oriented to monopolise the interests of seed companies.

In many countries, what passes as private industry's research, is funded by the government. In the USA, for example, in 1977, 45.4% of private industry's research expenses in electronics and communications was funded by the government, though the profits were accrued to corporations and not to the citizens who pay for the investment. The

corporations thus benefit from the taxpayers' labour without paying for it.

Private industry, by its very profit-seeking nature, has to target the rich and cater to their needs first and only then to the basic needs of the poor, who have much less purchasing power. And so long as the corporations are interested in profit as primary motive for research, the direction of development in science and technology cannot favour the poor or meet their real needs.

Science and Technology as Commodity

The Public Character of Science Compromised

In the early days of modern science, it was an article of faith for it to have all scientific work made public, in order to promote maximum possibility for the refutation of an unreliable hypothesis. Sir Karl Popper's hypothesis that modern science itself is a body of "conjectures and refutations" (see his work of that title), is now refuted by the fact that today much of sci-tech knowledge is not accessible to the scientific community, for two reasons.

In one set of cases, science is 'classified' knowledge resulting from military research which the state, possessing that knowledge, does not want to share with the enemy or with other nations. An increasingly large number of the highest paid and most competent scientific researchers today are sworn to secrecy, because they have chosen to be employed by some defense establishment, which has extracted that unprofessional vow of secrecy as a condition of employment. The public character of science has thus been betrayed by the military research scientists.

The other betrayal is by corporations. Scientific knowledge gained by the corporate industry research is kept a secret, because it is the source of profit which no corporation wants to share with others. And this knowledge is then transformed

into a commercially useful technology, and promptly patented, as in the case of seeds, medicines, diagnostic medical equipments and manufacturing and packaging technologies. Sci-tech thus becomes a commodity for trading in the market, on a lease or rental basis or for outright sale if the technology is becoming outmoded and no longer useful for the corporation which owns it. Denying and violating the article of faith about the public character of science becomes a necessity for pursuing corporate profit.

Sci-Tech as Marketable Commodity

Till the other day, we used to talk about three sectors in the economy: agriculture, industry and services. Recently, a fourth has been added: Information. Information means largely sci-tech information, and it is now becoming the largest sector of the market economy system; that is where most research is being concentrated, because the great demand is there and hence the bright prospect of greater profit. And who controls the market in this new and highly profitable fourth sector of the economy? Those who can afford to invest sufficiently in research to produce this new commodity called sci-tech information. At this point, it becomes evident not only that sci-tech has become a commodity in the market, but also that oligopoly on sci-tech research is fast becoming the most powerful tool of exploitation of the under-privileged.

According to the UNESCO Yearbook (1982), in 1978, out of a total of 2,131,500 personnel engaged in sci-tech R&D, 88.7% was in the developed industrial countries, while the developing countries' share (including India and China) was 11.3%. Actually, more than 90% was in the developed countries, since the UNESCO did not get the figures from the USSR which are not included in the 88.7%. Moneywise, the total world R&D expenditure in 1978 was 123.074 billion US dollars, again not including the USSR. And the developing countries' share of that investment was a mere 4.4 percent. In fact, less than 4 percent, if the USSR expenditure is included in the total. Official

figures from the USSR, for 1982 are 1.43 million research scientists and research expenditure of 23.8 billion roubles.

What this reveals is that the developing countries have just enough sci-tech to be capable of absorbing the "information" that the developed countries can sell us. We are mostly a market for the fourth sector of the economy, a market that is being furiously exploited with the consent of the money-making class in our societies, through collaborations agreements and "transfer of technology." Even the term "appropriate technology" belongs to this exploitative marketing system.

The poor of the world are at the mercy of those who control sci-tech, the most powerful instrument both of development and of exploitation. That instrument shapes our identity and dictates our values. It is a huge global enterprise which thrives by marketing this commodity called sci-tech. Our identities are caught in its mesh and we are no longer free to develop ourselves according to any human standards.

Science and Cultural Formation

We have pointed to the enormous socio-economic power of science, which underlies our political economy and our global exploitative structures. We should also look at the mind-deforming power of science. This is not to detract from the great achievements and potentialities of sci-tech in itself, but to review the ways it has developed in our truth-distorting world.

Modern science has been unconsciously based on naive realism, or the philosophical idea that things are generally what they appear to be, and that the world can be known as it is in itself. Of course, science constantly reveals hidden relations between forces, fields and things: yet, it is still about the relations among phenomena that it speaks, not about what lies behind the phenomena or at their base.

Though Quantum mechanics has been there now as scientific theory for at least two generations, it is only now that its metaphysical implications are being fully or partly grasped by scientists and philosophers of science. Subatomic physics clearly shows that the observed object is shaped by the observer's sense-and-mind and its extension, the measuring instrument. There is no objective world out there. Neither time nor space can exist in themselves. Things are not as distinct or discreet as we once supposed. Everything is inextricably interconnected. Naive realism has too naive a conception of reality, which may be all right for operational purposes, but does not depict the true character of reality-perception as a joint product of our knowing equipment and what is out there. There is ultimately no theory in science that explains reality, which seems to defy science and its methods.

As the sophisticated western liberal realises this, he quietly abandons theory, which cannot be defended and opts for various breeds of pragmatism. This happens not only in the natural sciences, but also in politics, economics, sociology and other human sciences. Joseph Rouse, an American philosopher-sociologist of science has made two important points in his *Knowledge and Power: Towards a Political Philosophy of Science*, which are important for our reflection about science and identity. First, modern science is to be seen only as a field of practical activity, rather than as a theoretical endeavour. Second, the epistemological and political or power dimensions of science cannot be extricated from each other.

Rouse cites the well known American de-constructionist Richard Rorty's *Philosophy and the Mirror of Nature*, to affirm that the 300 year old distinctions between science and politics, science and art, science and philosophy and even between science and religion do not any longer make sense, "though this rhetoric has formed the culture of Europe." In other words, science is inextricably bound up not only with politics and economics, but also with other fields of human activity like

philosophy, art and religion. If that is so, and if science is as powerful and pervasive as we have shown, then it does fundamentally affect human culture, which is an amalgamation of all creative human activity.

Science gets its prestige from a myth; that its practitioners are a community of saintly and ascetic, noble people heroically pursuing truth for its own sake. The fact, however, is that the scientific community is composed of ordinary mortals like the rest of us, driven by all the passions of greed, lust for power and desire for glory, ruthless competition, and even a good deal of faking. Our own ruling *elite*, when it talks of the 'scientific temper' and 'secularism' as panacea for all our ills, are simply mouthing the outdated dogmas of a defunct western liberalism.

Among western philosophers, Martin Heidegger came closest to a deeper understanding of the western enterprise of modern science. Heidegger sees modern science as the logical and final consequence of the basic western stance of standing outside nature and trying to understand it from the outside. "Science does not think," he said, adding as an afterthought. "in the way thinkers think." For Heidegger, western science is the consequence of a mild panic endemic in western culture and psyche. European human *dasein*, according to him, is always uneasy about the `other', whether that other may be a person or thing. And until it dominates the other it cannot be secure. So, according to Heidegger, it creates a whole system of if-them perceptions; if the other acts this way, then act this way. If you know how it is going to act, then you can always find a way to counteract and control it.

According to Heidgger, modern science is the last stage of western humanity's forgetfulness of Being, the first two stages having been western religion and western philosophy. I have discussed this at some length in my forthcoming work *A Light Too Bright* (State University of New York Press, 1991). Here, I need only to point out that for Heidegger modern technology's

real nature is in its defiance of that which is, forcing it to yield up its secret, so that we can use that which is, according to our own choice - to make it, as he puts it, a stand-by slave, waiting to do our bidding. Technology makes mountains and rivers as well as nature itself our slaves, our *Gestell* (Gestellung?) or standing reserve to be utilized according to our desires. Science sets up nature as a system of coherence of forces; technology moves into capture it and enslave it. Technology, Heidegger says, is not a consequence of science; technology reveals the true nature of science; science came about first, but its motivation from the beginning was technology.

At this point, Heidegger introduces an interesting distinction; between the 'correct' and the 'true'. What sci-tech reveals is correct but not true. To find the correct may often mean losing the true. In science, humanity makes the universe his/her object; in technology, he/she turns it into his/her standing reserve. The end result is that the new technological humanity sees only itself, wherever it looks. As Heidegger puts it: "In this way the impression comes to prevail that everything that humanity encounters exists only insofar as it is his/her construct. This illusion gives rise, in turn, to one final delusion: it seems as though humanity encounters only itself...*In truth, however, precisely nowhere does humanity today encounter itself, i.e., in its true nature.*" (Heidegger, *The Question Concerning Technology*, emphasis original, slightly edited to eliminate sexist language).

The biggest charge against sci-tech so far is that it eclipses humanity from its own view. Unless, we reflect on the true nature of sci-tech and its eclipsing influence and power over our perceptions, we will not be able to use sci-tech as a human instrument for cultural creativity and for meeting genuine human needs.

Towards a Conclusion

It seems clear, that we cannot meet the basic needs of humanity and sustain our global population without the aid of some kind

of science and technology. Our pre-scientific ways of production simply will not meet the need, though many Gandhians might say so. It is not a romantic retreat from sci-tech and industry that will take care of the issue. It is the colossal and uncontrolled power of the sci-tech establishment that needs to be remedied. Humanity cannot afford to simply let that establishment rule, dominate and exploit. Sci-tech has to be liberated to become a handmaid of humanity, not an oppressive dictator. It should not be allowed to shape our identity, but we should be able to use it for the proper shaping of humanity's identity, in accordance with norms wisely chosen, not by sci-tech, but by humanity itself.

That is indeed a tall order. The Colossus must be tamed and made responsive to genuine human needs. One can hardly expect the state to do that for us, since the state is everywhere part of the system and unable to change the system itself. The people have to take charge of the job of making sci-tech responsive to humanity's real needs, not the needs of corporations and defense establishments.

The first stage is creating awareness of the problem simultaneously in the community practising sci-tech and in the general public. Self-awareness and self-depiction are important elements in shaping an identity. We in India, under Jawaharlal Nehru's well-intentioned leadership, opted for a secular or western liberal identity. It does not fit our people and they are reverting to communal identities, in order to find themselves. Just as sci-tech is exploited by the power brokers of society, they are also now exploiting religion to suit their selfish ends.

Our *elite* leadership shows very little capacity to reflect on identity questions, except by positing narrowly communal or unfeasible secular identities. Neither *Hindutva*, nor the much-vaunted secularism can help solve the problems of Indian identity. Both are equally repudiations of the noble humanist heritage that is ours. Not the humanism of western liberalism,

which is without foundation, but the noble humanism of the Buddha and the Gita, of the Koran and the Bible, of the Guru Granth Saheb and the Zendavesta.

But that humanism has to be freshly formulated to fit our pluralist context; it cannot be a rehash of the superficial humanism which has developed in the West, and which is now known to be without proper foundation. It will not be either a secular humanism or a scientific humanism; the latter too has now proved itself to be without foundation and is in the process of reformulation. We can learn from all, but the foundations must be laid deep into our own rich and varied Indian tradition, which is certainly not *Hindutva*.

If this identity is to fit India's psyche, it must have a transcendent basis without being parochial or divisive. It cannot ignore sci-tech, but must be capable of going beyond it. What is even more important, sci-tech must be liberated from its bondage to war and profit, and from its false pretence to be the only way of knowing and doing.

The natural and social sciences must enter into profound dialogue with art and philosophy, music and literature, but also with the religions, for science has no monopoly of truth and technology has no monopoly on the right way to act. Perhaps, while all this exercise is going on, there must be a simultaneous effort to eliminate war, to enforce justice both within and among nations, and to maintain an environment fostering life. It is precisely in the context of seeking remedies for war, injustice and environmental disruption that humanity can also seek to go beyond these to find a human identity.

There is nothing sacrosanct about Indianess. If it is not at the same time humanness, it is worthless. National boundaries, whether they be of India, the USA or the Soviet Union, are mere historical accidents and have no absolute value. But they are temporarily necessary, because we are not yet secure about the large human identity and have to stick to more manageable

smaller identities, whether national or regional. But these latter should in no wise be absolutised. They should be held in the framework of belonging to a common humanity, a mutually responsible global human community of nations.

At the same time, even if the national identity is parochialised (as in the past, the USA and many European nations thought of themselves in terms of a White identity, and many Islamic nations still think of themselves in terms of Muslim identity) and made exclusive of minorities it will result in havoc. No single religious tradition can be imposed on a nation like ours. But, neither can the secular scientific identity chosen by our leadership of yesterday, be imposed on our people. Sci-tech and secularism cannot define or determine our identity. Sci-tech can serve, when it is define our identity liberated. Secularism can only be the choice of a few.

We need sci-tech. Without it we will make our people perish. But it cannot be allowed to become the master or the shaper of our identity. This is possible, only when two preliminary conditions are in process of fulfilment: (a) the establishment of just, peaceful and ecologically sound societies: and (b) the creation of a deeper awareness of the true nature of science and technology as enterprise, as commodity, and as reality-distorter, among our common people, among our sci-tech and industrial community, and hopefully among our political leadership.

CHAPTER 14

Heritage and Technology

In Harmony or in Conflict

The two questions, recently posed by Prime Minister Rajiv Gandhi, to the philosophers of India seem to merit some response. The Prime Minister, who is reported to have refused to inaugurate the Indian Science Congress, readily inaugurated the Diamond Jubilee Celebration of the Indian Philosophical Congress (Hyderabad University, December, 1985). In his address to the two hundred or more professional teachers of philosophy, he made it clear that there was no alternative available to India in entering the twenty first century, except to adopt modern technology. This was necessary in order to banish poverty, ignorance and ill-health from our land, and was not a question to be debated. The questions were not about the scientific technological path versus other alternatives. He raised two questions:

a. Is there an intrinsic conflict between the Indian heritage and a technological civilisation?

b. If we want to keep the best values in our Indian heritage along with a technological civilisation, what are the values to be particularly cherished and encouraged?

Since Rajiv Gandhi did not himself seek to answer the first question in any detail, which he left to the philosophers to discuss, we will begin with some which he did provide. These comments are relevant to any answer to the first question.

Speaking from Rajiv Gandhi's personal experience, he gave two instances of values he regarded as especially significant to him in his work as Prime Minister. Both are derived from the Bhagavadgita. The first, was that of *Nishkama Karma* or action without desire for the fruit of the action. For him, it was important to act in the right way, out of a sense of duty and rightness, without worrying too much about how many votes the action would gain or lose, or about whether other people would applaud or deplore. Obviously, our Prime Minister had acted in this way, though he himself did not say so, both in the Punjab accord and in the Assam settlement. The political losses, at least for the time being, seemed to be quite heavy. Yet the issues were settled, perhaps, only temporarily. And settled in such a way, that the opponents of his own party gained the short term political victory.

The other value to which he referred, tracing it down to the Gita, the Prime Minister puts rather felicitously: "Equanimity is the better part of valour." He meant to say that in order to take courageous action in a moment of crisis, the most important need was not to be flustered. This is one quality of Rajiv Gandhi's which has been widely acclaimed - his unflappability in the face of crisis.

These two illustrations, he gave from his personal experience raise several questions.

The first is, how are these values to be interpreted in our democratic context? In the Gita, the value of *nishkamakarma* is proposed to Arjuna the warrior in the field of battle, by his charioteer, the Lord Krishna. Arjuna faced the moral dilemma between defending the righteous, and for that purpose, killing his own cousins and relatives in battle. The Lord's advice to

him meant essentially the exhortation to do his duty as a warrior prince without worrying about who gets hurt. Can this be accepted as a value for a modern democratic state, where the will of the people seems to claim priority over what is right? Can the head of a democratic state simply take the right action without considering what the people want, and without calculating the political cost? It is true that both in the Punjab dispute and in the Assam question the majority of the Indian people approved the actions taken by the Rajiv Gandhi government, though later there were second thoughts for many. But, the question remains: In a democratic state, is it possible to apply the principle of *nishkamakarma*, when the democratic process demands that political costs be taken into account?

If Rajiv Gandhi can demonstrate this righteous principle consistently, he may be laying the foundation of a new *rajaniti*, and who knows, the people in general may support him despite a temporary loss of votes. If *dharma*, which is rightness of attitude and action, can thus be the basis of a democratic *rajaniti*, we may be opening a new chapter in political history, one that gives the lie to the principles of Machiavelli's *The Prince*, which now dominates politics.

About the other principle of equanimity in the face of crisis, this would not be a new principle, but is in fact the crux of western diplomacy as it is now, One need not even go into the Vedas or epics of India to find this principle, which is fairly universally accepted, even by criminals and great deceivers.

The second question is: On what grounds does one choose certain values and reject others, from one's heritage? What is the criterion of selection? Is it just usefulness? Such an approach would be a denial of the Indian heritage. In the Gita as well as elsewhere in the Indian tradition, *nishkamakarma* is an integral part of *Karmayoga*, the way of seeking unity with the divine through right action, without desire for its fruit. In other systems like *jnanayoga*, *nishkamakarma* is preparatory or propaideutic for seeking fulfilment through *sravana, manana* and *nidhidhyasa*, through heeding, contemplation, and disciplined meditation, as a way to seeking *mukti*. Can *nishkamakarma* be severed from its yogic context and made a principle of political ethics, simply because one finds it useful? Why leave out *sravana, manana* and *nidhidhyasa* and accept only *nishkamakarma* as a principle? Are we not doing violence to the principle itself by doing so? This is not a rhetorical question, but one that needs to be discussed.

A third question is, how are these values, once chosen from our heritage, to be inculcated in the people? It is clear that the values for which Rajiv Gandhi was asking were not to be limited to the head of the administration. It must apply equally to the President, Prime Minister, all ministers and government officials, as well as to all the people. Values cannot be inculcated by precept and preaching alone. Rajiv Gandhi may be justified in believing, that his own example would have a multiplying or emulatory effect on the rest of the government and the people. His namesake, Mahatma Gandhi showed us the extent to which this can be true and not true.

At this point, there is no need to belabour the point that Rajiv Gandhi's new *rajaniti* will have to be assessed by future generations, not so much by its theoretical consistency as by its capacity to transform the negative ethos, now prevailing both in the government and in the apparatus of the ruling political party as well as others. There will need to be more than precept and example. Can *nishkamakarma* or equanimity be infused in others through discipline? Perhaps yes, but this will have to be demonstrated again. How does one get these values into the present political ethics, which is dominated by the opposite principle of seeking personal and group gain even at the cost of justice and integrity? How do we bring these values into the educational system? Is it not much more difficult and demanding than introducing computers and modern technology into the school system?

Values and Technology

After having briefly raised some questions in relation to the values suggested by Rajiv Gandhi, we are now ready to move into the question whether there is an intrinsic conflict between the values of our Indian heritage and those of a scientific technological civilisation.

The answer to that question depends largely on our analysis of the intrinsic nature of the scientific-technological civilisation and its fundamental features. Since we cannot attempt such a comprehensive analysis here, we can only point to some select features which are relevant to our question.

First, there is need for a clarification of what we mean by modern sci-tech and a scientific technological civilisation.

The philosophy of science has discovered that science cannot be defined *a priori*, in such a way that we can use the definition to distinguish between what is science and what is not science. Science is no longer defined as objective truth, since all scientific theories are subjective creations hypothetically proposed by the scientific observer and not directly yielded by objective reality. It is a subjective theory, tested by subjective-objective praxis. Neither is science proved truth, for every scientific hypothesis has the unspoken qualification "in the light of our present knowledge, and subject to reformulation in the light of other data." Goedel's theorem has conclusively shown us, by mathematical demonstration, more than fifty years ago, that no science can be a completely self-consistent and self-contained system.

Quite apart from the problems of definition or demarcation criteria, and those of proof and objectivity, there is the further preliminary question about the distinction between science and technology. This is a distinction easy to maintain in theory and illustrate by example. But in practice the distinction is fading. What is known as "pure science" or scientific knowledge which is an end in itself or independent of technology is fast disappearing.

First, there is the phenomenon that most of the scientific research is financed by people or institutions with an interest in putting that knowledge to some technological use. Very little scientific research is pursuing knowledge for its own sake.

Second, there is the fact that advanced technology is today an integral part of scientific research. Take away the election microscope, the particle accelerator, the computer and a few other advanced technological devices, advanced scientific research would come to a virtual stop.

Third, there is the somewhat disturbing fact at least at the micro-level, the technological measuring instrument determines the momentum or position of a particle, and knowledge of the particle, independent of the technology of the measuring instrument, is denied to us.

As for modern technology, it is common knowledge that it is totally dependent upon modern science, and the integral relationship between science and technology has become so extensive, that it is more useful for thinking to coin a term like "sci-tech" than to make theoretical distinctions between science and technology.

That point needs to be clarified in order to make us see that the technological civilisation we are talking about is a sci-tech civilisation, rather than just technological. In taking a look at this sci-tech civilisation, we first recognise the fact that historically it arose within European culture and that it bears the marks of its historical cultural origin. We are already seeing that the sci-tech civilisation has fundamentally altered the cultural values of the West, but also radically transforms all cultures wherever this sci-tech civilisation is introduced.

Two of these changes have to do with the process called the enlightenment which provided the matrix within which sci-tech developed in the West. This was largely an eighteenth and nineteenth century phenomenon. Though modern science was born much before that, its great expansion and development

took place in the context of the Europe enlightenment which soon dominated the culture of European. The enlightenment reaffirmed and highlighted the main elements of European modernity - namely the repudiation of tradition, and the affirmation of the full autonomy of human reason. Along with this came the affirmation of secular humanism as distinct from Christian humanism, that man is both the measure of all things and also the potential master of all things through the proper use of reason through science and technology.

The repudiation of the authority of tradition and the exaltation of human reason as the arbiter and authority for knowledge and values, the twin principles of modernity and the European enlightenment, effected a new revolution in human consciousness, second only to the Copernican revolution or perhaps, in the long run, even greater in magnitude. It is the understanding of this second revolution that could provide us with a clue to answering Rajiv Gandhi's questions.

Europe likes to see its intellectual and cultural history in three stages - medieval, renaissance and modern.

The medieval period was one in which the authority of the Roman Catholic Church was affirmed, though not always acknowledged, to be supreme in all matters of European life: political-economic, scientific-technological, moral-cultural. Here, there were three realities in the world-view:

1. God as supreme ruler and judge
2. the Church magisterium - not the whole Church, but excluding the vast mass of ordinary believers, and with the Pope or the Bishop of Rome., as the bearer of God's authority as ruler and judge, and
3. the ordinary seculum with its people - the laity, the princes, nobles, the world as a whole.

It was the structure of this medieval christendom that was progressively challenged by three inter-related processes - the

European Renaissance, the Protestant reformation and the European enlightenment or *Erklaerung*. The Renaissance was powered by the rediscovery of the Greek Olassies; the reformation was a repudiation of the religious authority of the Church magisterium; the enlightenment repudiated all traditional authority including that of the Christian scriptures which protestantism has counter-posed as the source of authority. Where protestantism affirmed the authority of the individual believer's conscience to interpret the scriptures, the enlightenment insisted on the individual reason as the only source of all authority in all matters.

In this process, the three realities of the world-view of medieval christendom were replaced by two realities:

1. the human person whose reason was the final authority in all matters - knowledge and values, and
2. the world, which was to be known, understood and brought under control through sci-tech.

Though modern science began within the process of transition from the medieval to the modern world view, it found full freedom to develop only as the enlightenment in the 18th and 19th centuries provided the matrix of a rational world view.

The question before India is as follows. We did not, thank God, have in India something like the medieval Church claiming divine authority for one particular religion or one particular set of religions institutions. We had an extremely pluriform culture in which not only many religions co-existed but within each religion there was room for diverse points of view. There was also more or less full freedom for thinkers and groups of people to repudiate all religious authority and to develop secular system of thought like the *Caraka, Lokayata, Sankhya,* and *Baudha* systems. With the advent of the Moghul empire, our system, if any, had become even more pluralistic than before. New religious systems like the Sikh religion could arise and flourish.

The coming of the British and the impact of western intellectual systems powered a renaissance for us in the eighteenth and nineteenth centuries, more or less simultaneous with the European enlightenment. The enlightenment itself was rather late in coming to India, mainly through the educational system which was based largely on western liberalism.

If there was one movement that galvanized the nation and gave us new vitality as a people, it was the freedom movement. This movement received great impetus from the socialist revolution, and by the time we got to our national independence, the congress party, under Nehru's leadership, had already accepted several planks of a socialist platform. Unfortunately, however, these planks soon became largely verbal, as the middle class began to dominate the congress party, throwing out most of the leftists and socialists to form separate, but largely ineffective smaller parties. Technology, such as we had, went in two different directions. One,in the public sector, helped create the basic industries related to steel, coal, rail transport, irrigation, power, and food production. The other in the private sector, concentrated on consumer goods production, largely for the fast growing middle class.

Technology created, primarily through the private sector, a new class of people with a set of values unrelated to our heritage. Efficiency in management of production and marketing became the supreme value.

There was another factor which created new values from the technocratic managerial system. Government had put a large plethora of controls and restrictions on the private sector and had imposed fairly high tax rates (excise, income and sales taxes) on the private industry. Evading controls and restrictions and taxes became the new value of the managerial class. They were prepared to bribe, to falsify accounts, and to make large contributions to the political party in power, in order to obtain and maintain special privileges. Here begins the deterioration of the integrity of the political process.

Efficiency, one can say, is integral to the technocratic process of production and marketing of goods. Are bribery and corruption also intrinsic to the technocratic process? The answer is that it is more so in so called democracies than in disciplined socialist societies. As the political process in our so called democracy became more and more dependent on a share of the profits made by traders, manufacturers, civil contractors, and defence contractors, the degree of corruption, bribery and tax evasion simply grew enormously. Was this the fault of technology? Clearly technology had a share in the disintegration of values, for they were willing to bribe politicians and officials in order to gain their ends, rather than take it to the people as they should have, in a truly democratic society. It is no comfort to say that such large scale bribery and corruption exists in the advanced industrial countries like USA, Japan, West Germany, and France. This simply demonstrates that in a soft society with western liberal forms of the so called democratic governments, technological civilisation does undermine the values of integrity and probity. Even in a small state like Singapore, where a disciplined society was for a while able to arrest the onslaught of bribery and corruption, the opposite trend has already begun.

The People's Republic of China, a disciplined socialist society, recently, attempted to create certain zones where foreign investment and private sector economic activity were allowed. The result was seen to be disastrous. All the old values of integrity and probity soon broke down and there was large scale bribery, corruption, smuggling, alcoholism, prostitution, and all the rest.

It is reasonable to draw the conclusion that what affects values is only in part the work of technology, but in large measures the combination of private sector production and soft administration with technology.

Our Prime Minister, in his Hyderabad address, pointed to Japan as a model for India to emulate in entering a fully technological civilisation. He gave expression to the view that

in Japan the technological culture had not undermined traditional Japanese cultural values. Nothing could be farther from the truth. Sensitive Japanese observers are extremely concerned about large-scale erosion of Japanese culture, as a result of the introduction of a technological civilisation. We will do well, to make a more thorough study of what has happened to the Japanese people and culture, as a result of their wholesale adoption of western technology.

We should look briefly at the two west German interpretations of what has happened to European culture before we conclude with an Indian perspective on Rajiv Gandhi's question.

The first critique is radically negative towards science and technology, from Martin Heidegger. Heideggar has shown us how all thinking occurs within a given tradition, and the intellectual horizon opened up by it. No man or woman thinks absolutely, in the heavenly sphere of absolute truth, without presuppositions. A person can think only here and now, in the light of questions opened up by a tradition.

Heidegger, opens up a new horizon for us - namely to look at the western intellectual tradition as a whole - from the Greeks, to our day. His view is totally different from that of Hegel, who saw western thoughts, particularly Hegelian thought, as the culmination and fulfilment of all thoughts in all cultures and all religions of the world. Heidegger, on the other hand considers the whole western enterprise as a colossal mistake, a straying away from the truth. It is the attempt, beginning with the Greek philosophers, on the part of human persons to stand "outside" being, and to understand it objectively. Heideggar, focuses on what happens to the human psyche itself in the process of development from philosophy, through science, to technology.

Let us try to be concrete in illustrating this transition, which has a great deal to do with Rajiv Gandhi's question, which is the focus of our concern in this paper. Take a mountain for

example. 'Primitive man' sees the mountain as a reality with which he lives, and on which his life depends. He gives it a name - say Himalaya or Kilimanjaro or Rockies or Andes and develops attitudes towards it - not as an object, but as a quasi-subject. He weaves it into his religious self-understanding through myth and ritual, thus entering into a relationship of reciprocity with it. The mountain impresses him and his total being responds in awe and wonder. Its majesty and grandeur speaks to his depths as an aspect of the reality in which he participates. His psyche responds, not in the scientific quest to analyse and understand, but in the deeper human response of poetry and art, myth and ritual. It is a subject which has to be understood and overpowered. The mountain is a friend, the source of the rivers that water his land and breed the fish he eats - an awesome friend, nevertheless a friend after all.

In science, the perspective changes, with consequent changes in the human psyche itself. The search is now to understand, in terms of how it came to be by geological processes, to measure its altitude, to analyse its strata and its vegetation, its mineral content and causal relation to other phenomena like rain and flood. It becomes an object for the understanding, something to be explained and described independently of its relation to us. Sometimes that relation is also studied, but not subjectively, but in the context of a presumed objectivity. Already, says Heidegger, the human psyche is alienated from the mountain in the attempt to eliminate all subjectivity in the understanding.

Then technology comes along, and the human psyche again shifts its perspective. The mountain is no longer an object to be merely understood. The scientific understanding is used to visualise it as a potential resource - as a source of timber for our paper mills and furniture factories, as a deposit of mineral ore to be mined and milled for industrial purposes. The technology is then developed to exploit the mountain, to dominate it and make it our slave, serving our will and

purpose. Even climbing the mountain becomes an act of overpowering and domination. The subject-object relation leads to a master-slave, or owner-property relation.

To the scientist, the mountain is "nothing but" the result of geological processes. To the industrial technologist, it is "nothing but" a resource to serve him, to be controlled and exploited by him. Here, in this transition from understanding to over-powering, there is the second alienation in the human psyche.

All this change in human attitudes is often justified and validated in religious terms in the Christian west, for example in terms of the god-given vocation to *dominum terrae* or domination of the earth, as given to Adam and Eve by their creator. As the ecological crisis looms large, the *dominum terrae* doctrine is questioned and sometimes accused of being responsible for all the troubles of pollution, resource depletion, and disruption of the delicate balance which sustains the life-world or biosphere.

Heidegger sees the whole western intellectual-industrial enterprise as a single whole, from the post-Socratic Greeks to our time. The secular - scientific - technological adventure of western humanity has its roots in the original stance of Greek philosophy, which unlike Socrates, stood apart from beings and questioned being, from that stance. From Thales to our day, the western attempt has been to get at universally valid synthetic judgements about "what is really there."

According to Heidegger, philosophy certainly strays from its path when it takes a supposed stance outside the totality and seeks to understand it through synthetic inductive judgements. He would find fault with those of us who use philosophy for some kind of a cultural synthesis or 'universal philosophy' which can serve as a basis for some 'planetary culture'. Such a universal philosophy may even try to synthesise the various philosophies of the world - Chinese, Indian, African, Middle Eastern,

European, and Maya - Inca. But such a universal synthesis would still be a continuation of the western project to form universally valid synthetic judgements about 'what is really there.'

Philosophy's task today, according to Heidegger is to question the very stance of separating the human consciousness/will and its objects, and of demonstrating the severe limits of verbal or conceptual language in approaching the truth. I believe, this is relevant for us.

The Thought of Juergen Habermas

The most ambitious project to find a system of universal synthetic judgements has been launched by our other German contemporary, Juergen Habermas, formerly of Frankfurt School of Social Research and the Max Planck Institute. It would, indeed be audacious on my part to sketch here the main lines of this colossal system of "universal pragmatics." His main writings are now available in English, almost all published by the Beacon Press in Boston, Massachusetts. I would draw your attention especially to *Knowledge and Human Interests* (1968/71)[1], *Theory and Practice* (1971/73),[1] *Legitimation Crisis* (1973/75)[1] and *Communication and The Evolution of Society* (1976/80)[1]. A compendious summary of Habermas has been provided by Boston University's Thomas McCarthy in his *The Critical Theory of Juergen Habermas* (Hutchinson of London, 1978). If you find McCarthy forbidding, go to Garbis Kortian's *Metacritique: The Philosophical Argument of Juergen Habermas*, (Cambridge University Press, 1980). Kortian is superbly lucid and penetrating.

Habermas takes a different direction from that of Heidegger. He wants to pursue a critical theory buttressed by metacritical critique of the theory itself. Habermas is anxious not only to keep theory and practice together, but also to give primacy to practice. He follows Marx's metacritique of

[1] The first date refers to the original German work, and the second to the English translation

questioning Kant's separation of pure reason and practical reason with primacy given to mind over will. He follows Marx, in rejecting Hegel's attempt to resolve contradictions in the realm of reflection rather than in social reality. But, he questions Marx in his underplaying the role of reason in the emancipation of humanity.

Habermas thinks that while Hegel capitulated to metaphysics in postulating his philosophy as a universal science, Marx and the Marxists have capitulated to its latter-day counter-part, scientific positivism. In order to find out what is wrong with Hegel and Marx, Habermas goes to the antecedent Kantian critique of a three fold analysis - pure reason, the moral will, and the aesthetic judgment. The Kantian critique has been substantially altered by the thought of Hegel and Marx. But the issue today is to come to terms with the phenomenally successful world of the physical sciences (*Naturwissenschaften*) and the human science (*Geisteswissenschaften*). In both areas the epistemological issue today cannot be stated in the Kantian categories which in a sense are pre-empirical. Today, we should focus more on the categories of validating or certifying knowledge, rather than on the mental process of knowing. These categories of validation cannot be the same for the physical sciences and the human sciences. Neither can either of these sciences by its own method provide or justify the categories of validation.

But epistemology itself cannot be reduced to method, as positivism tries to do. It has to reflect on the nature of reflection itself, something which positivism fails to do.

Such reflection on reflection, Habermas claims, cannot be contained within the methodological ambit of either the physical sciences or the human sciences. It is a third level of investigation, which Marx wrongly tried to subsume under the category of political economy. What is now pursued as philosophy of science and philosophy of history are not simply part of the methodology of science or the historical method.

Both the physical sciences with technology arising out of them, and the human sciences with categories of moral principles of human social interaction, have their antecedents in something pre-scientific, i.e., the question of the interests implied in all knowing. These interests are perennially human and therefore not to be left unexamined or rejected as pre-scientific.

All knowledge is bound by interests - that is the thesis of Habermas' seminal work on knowledge and human interests. This interest is dual - not singular as Marx pre-supposed. Marx recognized the practical interest in all theoretical knowledge, but he interpreted that interest as exclusively instrumental. Marx was right in defining the specificity of the human as distinguished from animal as tool-making ; *homofaber*. It is by tool-making that human beings, unlike animals which adapt themselves to the environment, began adapting the environment to their interest and purposes. It is out of this tool-making activity that human persons became interested in knowing and changing things. They saw the possibility in the stone of becoming an axe, and proceeded to shape the stone to suit the human interest.

But this tool-making, or instrumental interest was but part of the whole human interest in knowing the environment. Human persons found the environment as conditioning or confining their existence. When confronted with the fish in the flowing stream or the running animal in the woods, human beings were unable to catch the fish or kill the animal with their bare hands. They found themselves conditioned and limited in their capacities. It was necessary to be emancipated from this limitation. Their interest in tool-making was motivated by the desire to overcome their limitations and be emancipated from the conditioning or limiting element in themselves. This emancipatory interest precedes the tool-making interest. Knowledge thus has a twin interest, instrumental as well as emancipatory, the one arising from the

other. They learned the sharpness of stone and the power of the bow and the sling, in order to emancipate themselves from their own conditioned-ness.

Knowledge itself is an event in the process of material exchange (*Stoffwechsel*) with nature, according to Marx. But the adult male or female does not fall from the sky. The formation of a human person does not begin or proceed in a purely individualistic context.

The human child is born, helpless and dependent on others, as for example, on the parents. The child is formed and comes to maturity in a double process - handling things with its mouth and hands, which is the beginning of material exchange process, and the socialisation process within the family where it acquires its knowledge and skills. It does not become a person merely by material exchange, but also by social interaction with other persons - parents, siblings etc. In this process too there is a movement from dependence to autonomy or emancipation. Even the autonomy is not total; the dependence relationship in material exchange and social interaction goes side by side with the process of emancipation from material conditioning and from parental dependence.

Along with the material exchange and the social interaction arise the contradictions, not only of knowledge, but also of existence and relation, which have to be overcome or resolved. The emancipatory interest thus continues both in the material exchange and in the socialisation process, i.e., in the overcoming of contradictions in both theory and practice.

The mistake of Kantian epistemology, as Hegel pointed out, was that of starting with the individual adult subjective ego and consciousness existing in isolation as a given, and not giving sufficient attention to the formative processes that gave rise to the ego and consciousness. The same mistake of starting with the adult person as a given occurs also in theology and spirituality, as in philosophy and epistemology. If we want to

ground theology and spirituality in reality, we will have to take account of the formative processes that constituted the consciousness and the world, as well as of the interests and expectations of that consciousness.

Towards A Reconstruction of Human Formation

On the basis of the foregoing analysis one can delineate three levels of human activity and knowledge, by which we form and shape ourselves.

a. Science - Technology
b. Political - Economy
c. Culture - Meaning - Value

In each of these areas, there are separate normative categories and validation criteria, all of which, in so far as they have to do with human formation, have also to do with spirituality and Christian formation. In all three areas, there is a constant inter-play of theory and practice. Theories are formed out of the experience of practice; theories are also to be tested and attested in practice, though the practice varies in the three spheres. In contemporary thinking, these three spheres replace the three spheres of Aristotle's thinking which had suggested the three critiques of Immanuel Kant. For Aristotle, *theoria, praxis* and *poesis* were the three spheres of pure contemplation or mental activity, which is what *theoria* means to him; of moral and practical action within the *polis*, which to him was *praxis* and to us political economy; *poesis* referred to the production of useful artefacts for which *techne* or the skill of cunning art was needed. In Kant, the three spheres became critique of pure reason, critique of practical reason and aesthetic judgement.

Our three spheres can only be distinguished in thought but never made independent or self-contained. They interpenetrate and condition each other. We need not debate the Marxist position that it is the developments in the foundational sphere of science - technology i.e, in the forces of production that

revolutionize and change the patterns in the super-structure of political economy and culture. That debate will lead us to far a field. Nor need we debate the positivist dogma of total separation between is and ought or fact and value. It is a dogma that stands refuted, the moment we recognize the relation between knowledge and human interests.

We know today that scientific theories are themselves subjective creations, and not dictated by objective reality. Even in so-called pure science, we recognize value judgements like the requirements of elegance, simplicity and predictive power. We need not debate the false claims of positivist scientism that scientific knowledge is the only kind of knowledge that there is, and that it is proved and completely objective knowledge. Those claims have been adequately and fairly finally repudiated[2] by reputed philosophers of science.

We can, however recognize the fact that there is an emerging consensus about validating norms or criteria of confirmation in the various spheres, though even here the consensus is far from complete or equally clear in all the three spheres. The three spheres have three distinct types of logic. In the first sphere of science - technology the instrumental or operational interest dominates, though the emancipatory interest is not absent. On the validation criteria we still have the on-going debate between the tribes of Karl Popper, Thomas Kuhn, Paul Feyerabend, Imre Lakatos, Michael Polanyi, and others.

In the realm of political economy we have no consensus on emerging criteria for validation. The two basic options of Marxist-humanist socialism, and liberal - bourgeois market economy system, with their myriad internal variations, are both now contested by Islamic ideas of theocracy and quranic law.

[2] See for example, Alan Musgrave and Imre Lakatos (eds.) Criticism and Growth of Knowledge, cambridge University Press, 1970 (reprinted 1976) especially, p.52.

The validation criteria of science - technology or even critical reason cannot be applied to the realm of political economy. We will simply have to accept the plurality and seek to affirm only the principles of openness of dialogue, concern for justice, peace and the dignity of the human person, and a commitment to keep the ecological crisis and the arms race from blowing up the delicate bio-sphere.

When we move into the realm of culture, value and the critical unmasking of hidden interests operating in society (*Ideologiekritik*), we have again no certain validation norms to appeal. The western discussion on these subjects has yielded many precious insights, but many of the deliverances of western thought on languages, culture, the role of reason and will, the nature and destiny of the human person, the origin and nature of the universe, the nature of truth and beauty and the meaning of existence have led to no basic consensus even in the west, not to speak of the other cultures. Faith and unbelief, reason and revelation, religion and secularity - the list of unresolved issues goes on endlessly. As for the anti-hero of Persig's *Zen and the Art of Motor cycle Maintenance* the effort to answer the age-old question: "what is the good?" simply drives us mad.

But these remain the three basic realms in which human formation goes on. The option to escape these controversial realms and seek fulfilment in solitary meditation seems attractive but turns out to be impossible and ineffective. It is in the midst of the struggles of the three realms that human persons and societies are formed and shaped, whether in the West or in the rest of the world. The positivist quest outlined by Auguste Comte has come to grief. The hope that we can leave theology and metaphysics behind to find absolute certainty and sure ground in positive science has proved vain and hollow. *L'etat scientifique on positii* as the final stage of the human quest for emancipation and fulfilment has turned out to be an illusion. This disillusionment is at the heart of the

current malaise of western civilisation. As the philosopher Imre Lakatos of London puts it,

> "Now very few philosophers or scientists still think that scientific knowledge is, or can be, proven knowledge ..... But few realize that with this the whole classical structure of intellectual values falls in ruins and has to be replaced." [3]

But with what shall we replace it? Juergen Habermas proposes to use a grandiose scheme of universal pragmatics, based on the idea of critical or meta-critical self-reflection on the three realms of human activity. Self-reflection is the way to emancipation, says Habermas. His is an attempt to reinstate the 18th century European enlightenment and its project of overcoming tradition, dogma and authority through the exercise of critical reason. He gives a new definition to the philosophical task by posting emancipation or liberation as the final end of philosophy, and critical reflection on praxis as the way to the *tepos*.

Towards an Indian perspective on Sci-Tech today

I have the personal feeling that the Heideggerian critique is of minimal interest to Indians, though it is strikingly similar to Mahatma Gandhi's sweeping critique of western civilisation. Gandhiji said:

> "This civilisation is such that one has only to be patient and it will be self-destroyed .... According to the teaching of Mohammed, this would be considered as a satanic civilisation. Hinduism calls it the Black Age or *Kaliyuga*."[4]

Rabindranath Tagore and Sri Aurobindo have expressed similar points of view about the inner rottenness of the civilisation that we have progressively been adopting in India. We are now in the process of taking this fatefully resolute step to a more definitely technological civilisation. There is no clarity in the minds of Indian philosophers as to what this path

[3] *Criticism and the Growth of Knowledge* p.92.
[4] M.K. Gandhi, *Hind Swaraj*, Navajivan Ahmedabad, 1938, p.20.

involves. But at this point, we can say a few things, first negatively:

1. The emphasis on efficiency leads to depersonalisation. Human feelings, concerns and interests are made secondary to achieving the matter in hand.
2. The sci-tech approach is basically not respectful to the environment. If the utmost caution is not taken, not only resource depletion and environmental pollution, but basic damage to the life-sustaining system can result.
3. The sci-tech approach shelves problems of culture and religion into a low priority box. The basic spiritual quest of humanity does not normally find a place on the agenda of a sci-tech oriented civilisation.
4. When the sci-tech approach is set in a market economy frame, it leads to alienation, excessive greed, acquisitiveness, and continuous erosion of human values by the powerful flow of a commodity culture.

If these four negative points are kept in mind, the values that we try to bring out of our own Indian heritage will have to counterbalance these. I suggest a few:

a. From the Vedic tradition - the concepts of *Rta* and *yajna*, cosmic order and the self-going of sacrifice.
b. From the Buddhist tradition - the concepts of *karuna* (compassion) and non-dogmatism.
c. From the Jain tradition - the practice of austerity and self-discipline.
d. From the Gita tradition - the noble concept of *nishkamakarma*, or productive activity not for one's own profit, but as service to the community.
e. From the Vedanta tradition - the great concept of the unity of all being, based on this unity of all humanity, and a respectful attitude towards all life and all existence - so

important for the environmental issue.

f. From the Christian tradition - the concept of love as active service to all humanity in need.

g. From the Islamic tradition - the concept of equality of all human beings, without reference to race or caste.

h. From the Sikh tradition - the concept of being a disciple (sikh) ready to do battle for the truth, disciplined and groomed for action.

i. From the Secular tradition - The commitment to justice, freedom and dignity of human persons, and the spirit of free enquiry and national discussion.

These values thus listed are only illustrations. But as has been pointed out, formulating values is not the same as in nucleating them. The integration of a techno-culture with traditional Indian values demands a vigilant struggle against dehumanising and depersonalising values. The media, the educational system, the trade unions, the political partied - all will have to co-operate in the inculcation of these values in a proper and adequate way throughout our urban and rural societies. Whether such integration is possible will be shown only in that campaign. The values will have to be brought in all three levels - science - technology, political economy and philosophy - culture.

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Science, Technology And The Future of Humanty

by Paulos Mar Gregorios

The late Metropolitan Paulos Mar Gregorios (1922-1996), former Principal, Orthodox Theological Seminary, Kottayam, Kerala and the first Metropolitan of the Delhi diocese of the Orthodox Church had an abiding interest in science and technology, but was also a strong critic of the institution of science. He was concerned about the gross injustice in the distribution of money for scientific research on a global level, and also about the military-industrial-banking complex determining the priorities of scientific research. The commonly held view that nature is the non-human part of the created order was totally unacceptable to him. He believed that man cannot be understood or saved in isolation and that redemption in Jesus Christ is a cosmic one in which the entire created order participates. He advocated a sacramental, and not the so called objective understanding of the created order.

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